

Winter 2015

Art as a Tool to Communicate Science

Jillian Pelto

University of Maine - Main, jill.pelto@maine.edu

Follow this and additional works at: <https://digitalcommons.library.umaine.edu/honors>



Part of the [Art and Design Commons](#), [Earth Sciences Commons](#), and the [Environmental Sciences Commons](#)

Recommended Citation

Pelto, Jillian, "Art as a Tool to Communicate Science" (2015). *Honors College*. 241.
<https://digitalcommons.library.umaine.edu/honors/241>

This Honors Thesis is brought to you for free and open access by DigitalCommons@UMaine. It has been accepted for inclusion in Honors College by an authorized administrator of DigitalCommons@UMaine. For more information, please contact um.library.technical.services@maine.edu.

ART AS A TOOL TO COMMUNICATE SCIENCE

by

Jillian Peltó

A Thesis Submitted in Partial Fulfillment
of the Requirements for a Degree with Honors
(Studio Art, Earth Science)

The Honors College

University of Maine

December 2015

Advisory Committee:

Nina Jerome Sutcliffe, Adjunct Associate Professor of Art

Gordon Stuart Hamilton, Professor of Earth and Climate Sciences

Dr. Michael Grillo, Chair, Department of Art

Susan Groce, Professor of Art

Dr. Brenda Hall, Professor of Earth and Climate Sciences, Climate Change
Institute

Abstract

My thesis explores effective ways to communicate science through art. My main goal is to illustrate significant environmental issues in a way that engages people emotionally, as well as intellectually. Researchers need a means of sharing fascinating things to broaden people's horizons on science. In order to gain inspiration and ideas, I have researched and discussed a wide range of artists, past and present. This exploration has fueled the content of the body of artwork I have developed throughout this project.

Table of Contents

Introduction	1
Influential Artists	2
Artists and Natural Historians.....	2
Artists Sharing Science.....	8
Artists and Human-Induced Issues.....	13
My Collection of Artists.....	21
Artwork	23
Field Sketches.....	24
Take a Lesson from Nature: Recycle.....	26
Support Marine Reserves in the Antarctic.....	27
Washington Climate Change Series.....	29
Integrating Climate Change Data.....	31
Habitat Degradation Series.....	33
Moments of Observation Diptych.....	37
Thesis Portfolio.....	39
Sharing my Artwork.....	40
Works Cited	44
Author’s Biography	47

Introduction

Art has a power to communicate knowledge in unique ways. Over the course of my career at the University of Maine at Orono, I have had several research and scholarship opportunities that have been incredibly enriching. These experiences, in tandem with my passion for the environment, fuel my aspirations to share what I have learned. My artwork addresses important environmental concerns to raise awareness and to inspire people to take action. Art becomes a uniquely articulate lens with the power to express that alpine glaciers—which provide much of the world with water—are disappearing, that marine animals in the Arctic and Antarctic are quickly losing their habitats, and that deforestation is wiping out species of plants and animals. My exploration of using science to create art is teaching me ways to inform people, to challenge their assumptions and encourage them to act. My art shares the beauties of our natural world and awakens people to changes occurring. This Thesis Project is the foundation of a career centered towards making Earth a healthier planet.

In order to address my goal I have studied the work of many artists, past and present, who use art to communicate important ideas. I looked across disciplines, focusing primarily on those who portray scientific or environmental concepts. This collection of artists has inspired my own ideas. The artwork I studied helped me to discover ways in which artists approach ecological themes, and led me to my own inventive approaches. The following section is a synopsis of the artists I surveyed: who they are, what they do, and the inspiration I drew from their artwork.

Influential Artists

Artists as Natural Historians

Many painters throughout the history of art have demonstrated a broad enthusiasm for the natural world. Their images are lifelike in rendering and scientific detail. Representational depictions were key to the development of art. Many artists still work their whole lives to achieve the skill of realism. I researched a group of 16th – 18th century artists who found inspiration in nature and science and developed connections between creativity and the understanding of their environments.

Ulisse Aldrovandi (Italian, 1522-1605) was a naturalist credited with inventing the term “geology” (Vai & Cavazza, 2006). In addition to rocks, he was also interested in botany and zoology, and kept an expansive cabinet of curiosities. While not an artist himself, Aldrovandi was a creative soul; he is considered the father of modern natural history, and in addition to specimens, he collected drawings of plants and animals (Cargo Collective Inc., 2011). He likely formed this cabinet as a representation of his fascination with the wonders of nature: the drawings were often fantastical combinations of species. I was surprised by such an unusual collection in the 16th century, it speaks to the curiosity of Aldrovandi. His commissions of these artworks from a number of artists seem to draw on inspirations from technical illustrations: using scientific depictions to skew reality. The result is an interesting amalgamation of grotesque and elegant rendering (Fig. 1). I relate to his interdisciplinary passions: he collected exotic specimens from around the world, but used artists to depict the awe and oddities of nature. Aldrovandi could use his cabinet to both express himself and share wonders with others; my artwork arises from a fascination with nature and my desire to share it.



Figure 1. Ulisse Aldrovandi commissioned artwork (Cargo Collective Inc., 2011).

Giovanna Garzoni (Italian, 1600-1670) was a painter who was one of the first women known to master the still life. She was only briefly married, and chose to travel and go to school rather than have a family (J. Paul Getty Museum). She typically depicted natural objects such as plants and animals, and was very skilled in composition and scientific realism. Garzoni took care to represent life as is: with mold, rot, bugs, and imperfections that are part of the beauty and truth of nature (Fig. 2). I am just as inspired by her strength to pursue an independent lifestyle as by her skillful rendition of natural objects. I too strive to depict the reality of the natural world in my work. I include both positive and negative messages to communicate both the beneficial and the detrimental impacts humans cause on the splendor of the natural world.

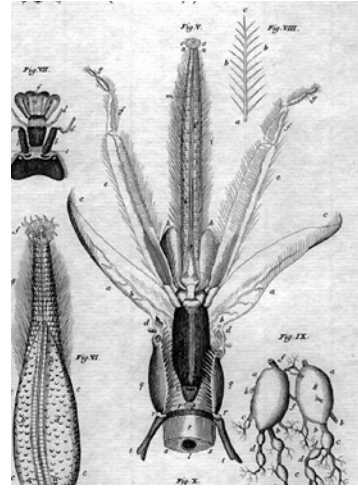


Figure 2. (left) Giovanna Garzoni painting (Wikipedia, 2015).
Figure 3. (right) Jan Swammerdam engraving (Cobb, 2001).

Jan Swammerdam (Dutch, 1637-1680) was a scientist who made many incredible advances in anatomy and biology. He used a microscope to study insects, and captured his findings with illustrations using copper engraving (Fig. 3). He wrote a long book on his analyses of the development of insects, published posthumously as the *The Bible of Nature*, which included his illustrations (Cobb, 2001). Since these depictions were engravings, he would have been able to make many prints to share with fellow scientists. Of course prints were the only option for sharing images, but famous men such as Leonardo da Vinci and Galileo Galilie are also recognized for the drawings they made for their research. I'm certain that because scientists had to draw things themselves they were forced to observe them more carefully. In order to draw something accurately you have to look very closely at its forms. Practicing art helps make me a better scientist and vice versa: observation is a key component in each field.

Maria Sibylla Merian (German, 1647-1717) was an artist who wrote, illustrated, and published books of botany and zoology. She divorced her husband and traveled to South America with her youngest daughter in order to study plants and animals in their

natural habitats. She wrote scientific essays on the subjects she studied. During her two years in South America she made many field sketches and notes, which fueled the creation of 82 engravings that she hand-colored (Meier, 2015). Her colored engravings have a stylistic quality that reminds me of modern illustration. She captures likenesses well but simplifies forms in order to make them clearer. It is evident that she lays out the image for the purpose of telling a story. She can show in one image the different stages of the life of a butterfly or a flower (Fig. 4). I enjoy that many of her artworks show a progression of life, and teach us about the species depicted. That she is able to illustrate this speaks to her scientific understanding. Reading about Merian and seeing her work, I can sense that she had a spirited nature and a curiosity that she was determined to satiate in spite of gender roles and limitations. Her simplified renderings influenced my screenprints: like Merian I want to tell an informative story. Selecting specific elements in an artwork helps to achieve this goal.



Figure 4. (left) Maria Sibylla Merian colored engraving (Meier, 2015).

Figure 5. (right) Johann Conrad Susemihl colored engraving (Wikipedia, 2015).

Johann Conrad Susemihl (German, 1767-1847) was an artist who used copperplate engravings to depict natural history. Along with a team of ornithologists and some of his family, he created surveys of birds. He hand-colored etchings and engravings, representing the differences between sexes, and wrote text describing each species' habitat, food, and nesting (Fig. 5)(Masi, 2006). His style reminds me of Merian's. They both did colored engravings; like her he captures likenesses well, yet simplifies color and shape. His approach makes each type of bird more distinct, which is important given the purpose of his work as an early bird identification book. Susemihl's talent in art translates into his skill of identification. Simplifying the complexity of nature is important to its communication. By depicting only the most relevant information an artist can more easily display a narrative: this is important in my work. His ability to convey the many different species stems from the power of observation. This is an important asset, and something that I have developed over time. Both scientists and artists study the forms in a landscape in order to better understand it. Artists are observing these landforms aesthetically in order to depict them; scientists are observing how these features formed in order to understand them. When I view a landscape I want to observe it for both of these purposes.

Dr. Edward Adrian Wilson (English, 1872-1912) was a naturalist, historian, zoologist, and painter, who accompanied Captain Robert Scott aboard the ship Discovery to Antarctica from 1901-1904. He then helped to organize and direct Scott's scientific Terra Nova expedition from 1910-1912, where he, Scott, and several of their comrades died on the way back from the South Pole. Before his first trip he would frequent the Natural History Museum to practice sketching wildlife. Onboard, he created a watercolor

series of seabirds from life. Once they reached the Antarctic, Wilson began a series of panoramic sketches of the various landscapes and coastlines. While staying the winter on Ross Island he conducted zoological research, assisted Scott with his meteorological studies, and created sketches of the harsh Antarctic winter (EdwardAWilson.com). The preliminary sketches were used to inspire his watercolors. One winter wonder he captured this way was the Aurora Australis (the Southern Lights) (Fig. 6) (VanishingIce.org, 2012). In the spring, when Wilson, Scott, and Ernest Shackleton journeyed south they saw new areas of the coastline, but were forced to turn back when their sled dogs were sickened, and the men got scurvy. Afterward, Wilson was able to recall much of what they had seen: he painted and drew topographical images, and phenomena such as parhelia (sun dogs) and fog bows (like rainbows but in fog). In his second spring there, Wilson went to Cape Crozier to study the rookery of Emperor Penguins. Given the season, he expected to find eggs, but instead found chicks. This knowledge led him to conclude that the birds must lay their eggs during the winter (EdwardAWilson.com). He used his observational skills and scientific curiosity to strengthen his artwork, and his artwork in turn reinforced those skills: this is something I too experience working across disciplines. I am inspired by his drive to draw from life in any circumstance, birds in flight, or a spectacular landscape in the dark Antarctic winter. I also create field sketches even if the conditions are cold or wet or windy, because those moments of inspection of the landscape allow me to feel closer to it (Fig. 21). By making art of a place I feel I do justice to everything it gives me.



Figure 6. (left) Edward Adrian Wilson painting (VanishingIce.org, 2012).
Figure 7. (right) Chris Drury echogram (Drury, 2015).

Artists Sharing Science

Some of Chris Drury's (English, b. 1948) artwork falls under the category of Land Art, which I associate foremost with artists such as Andy Goldsworthy. Drury makes site-specific sculpture, as well as works on paper and digital mediums. He collaborates with scientists and technicians to convey ideas of science or culture, making connections between art and science. This unity is shown in his myriad array of art created from a trip to the Antarctic. One piece titled *From Flight* superimposes an echogram—ice depth measured with radar—of the East Antarctic ice sheet, with an echocardiogram of the heartbeat of his pilot in the south, taken with ultrasound (Fig. 7). He explores this process in many other beautiful prints of echograms. In another piece he shows an image of Antarctic wind patterns and explores this further with a similar image showing the flight path of a tagged Albatross, following the winds and the circumpolar current (Drury, 2015). Sharing this information aesthetically is a good way to disseminate

interesting research with a broad audience. The data-based screenprints that I created are influenced by his direct way of incorporating graphical information in an aesthetic way.

The purpose of Chris Linder's (American, b. 1972) photography is science and conservation education. He documents scientific fieldwork with his photographs, creating art that brings science to life. His images have captured research endeavors all around the world, specializing in photographing Arctic and Antarctic projects. One of his recent groups of work is titled *The Polaris Project*, which documents areas in Siberia where permafrost is thawing, releasing large amounts of carbon (Fig. 8). Images include shots of the methane being released in meltwater, trees falling off embankments as the ground warms and shifts, and researchers at work. Linder defines his primary goals with three words: educate, inspire, and communicate (Linder, 2015). These words demonstrate a positive form of power. I would like my own work to achieve these principles as well: one example of this is in my diptych *Moments of Observation* (Fig. 27). The collaged text informs, the beauty of the landscape invokes a desire for preservation, and the key ideas of awareness and observation are communicated via the combination of figures and scene.



Figure 8. Chris Linder photograph (VanishingIce.org, 2012).

David Breashears (American, b. 1955) is a filmmaker and mountaineer who created GlacierWorks, a research-imaging project, which began when he found 1920's photographs of Himalayan glaciers taken by surveyor, mountaineer, and photographer Edward Oliver Wheeler (Breashears D., 2007). He revisited these sites and took photographs that exactly matched Wheeler's. He compared his images side by side with Wheeler's in order to expose the dramatic retreat of glaciers across the Himalaya and the Tibetan Plateau. The photographs of West Rongbuk Glacier on Mount Everest in Tibet, China reveal a vertical loss of 104 meters of glacier ice from 1921 to 2008 (Fig. 9)(Breashears D., 2008). I have seen several photographers and scientists use this comparative approach to study transformations in the landscape as glaciers retreat. It is a straightforward and powerful way to communicate current global changes. I have also seen painters use this tactic and have considered painting a prediction of a location in the future based on research and the study of changing landscapes.

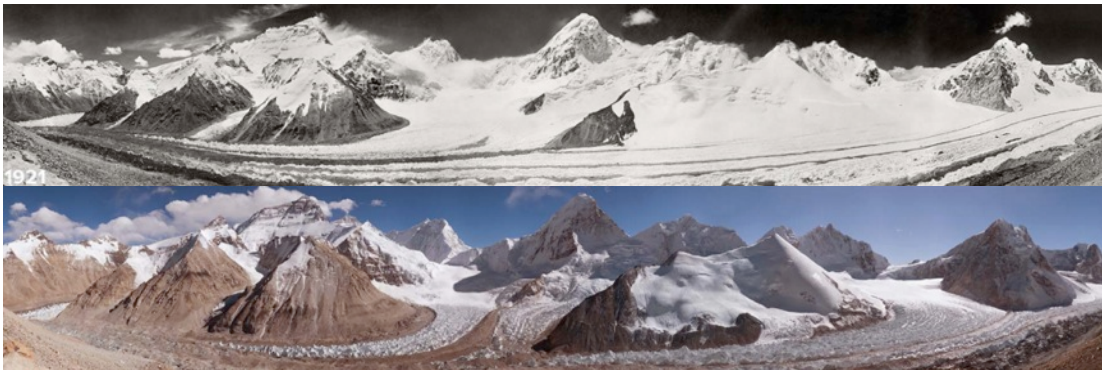


Figure 9. (top) Edward Oliver Wheeler 1921 photograph compared to (bottom) David Breashears 2008 photograph (Breashears D. , 2007).

Dr. Samuel U. Nussbaumer, a Swiss glaciologist at the World Glacier Monitoring Service, researches historical glacier variation in Europe and South America. He uses historical imagery, including photographs, drawings, and paintings, to detect changes in

the extent of glaciers such as the Mer de Glace (or Sea of Ice) in France and the Grindelwald Glacier in Switzerland. Along with four co-authors Nussbaumer, et al. published *Mer de Glace art et sciences* (Sea of Ice: Art and Science) (Nussbaumer, 2015). While I was not able to examine more than a couple pages of this text virtually, I was excited to see scientists using art as a historical record from which to compare past and present ice extent. This certainly is encouraging to see that the science community can be open to using art in combination with their research.

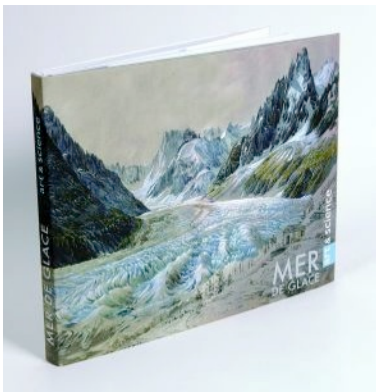


Figure 10. (left) Cover photograph of *Mer de Glace art et sciences* (Nussbaumer, 2015).
Figure 11. (right) Jean de Pomereu photograph (De Pomereu, 2015).

Photographer Jean de Pomereu (French, b. 1969) views Antarctica as a seemingly timeless landscape that is in fact in flux. He sees in it a history of our planet, an archive of paleoclimate events, a symbol of unification of countries, and a gauge of climate change. In other words, he holds Antarctica in high esteem and likes how virtually unaltered it is by human civilization. His work reveals the power of the icy realm of Antarctica, but also its fragility: his photograph of a large crack, *Fissure 2*, reveals instability, an indication of the annual spring breakup of the ice, and of the possibility of a more permanent break (Fig. 11). The ability to capture change with photography is a difficult but powerful skill. Change can seem subtle as it occurs, yet manages to

accumulate over time until it is significant. The slow pace of a changing climate can fool us until into acclimating while forgetting what once was. In other words, we may accept average warmer global temperatures as a norm because they have been slowly increasing, but we forget how much cooler global temperatures were only decades before. This is why imperceptible change can be difficult to visualize in art, yet Pomereu takes notice and is able to photograph it. His pictures all have elegance with a very minimal color palette and focus on shape, pattern, and contrast. The soft beauty of his work inspires me: color and light strongly influence mood, and thus can be chosen for specific purposes in art. In my work I strive to have such an eye for simple palettes and compositions.

Helen Mayer Harrison and Newton Harrison (American, b. 1929, 1932) are ecological artists who collaborate with scientists and artists to propose solutions to environmental problems. Based in California, they have been creating projects since the 1960's. Their past projects have included extensive mapping to draw attention to, and find solutions for, topics such as watershed preservation, urban renewal, agriculture and forestry issues. The Harrisons consider their client to be the environment: although their projects are meant to solve issues that humans face, the true patron they aim to please is nature itself. Not only do they want to assist in the preservation of the environment, they also aim to enhance aesthetic beauty in our lives by creating communities based around nature. Their art increases discussion on important concerns, leading to new ideas and answers. They form collaborative team studios in different locations around the world to approach various problems. An example is their exhibition *Greenhouse Britain*, an installation with five parts addressing potential global warming impacts on Britain (Fig. 12)(Harrison, 2009). The Harrisons developed a narrative that first highlighted the issues,

and then proposed potential solutions. I am really intrigued by the Harrisons because of the strong intellectual components that drive their installations. They are creating art about solutions that they come up with through collaboration. I have thought about how I may be able to use my artwork not just to raise awareness, but also to provide solutions. This would be an extremely complex undertaking, but in the meantime the written statements that accompany my art include websites where my viewers can donate or become involved in an issue. Being a part of a collaboration as the Harrisons have been will definitely be a critical part of promoting positive change.



Figure 12. (left) Image from a Harrison Studios project (Harrison, 2009).
Figure 13. (right) Edward Burtynsky photograph (Burtynsky, 2013).

Artists and Human-Induced Issues

Edward Burtynsky's (Canadian, b. 1955) photography focuses on the effects of industry on nature. He researches and seeks places like recycling yards, quarries, refineries, and mine tailings which most of us never see, even though we are culpable for these industries in our daily use of resources. His work reveals consequences and the importance of awareness and understanding of impact. Dependent on nature, we should be aware of the ways we mistreat it. Many of these images make me uneasy because they

reflect the negative repercussions of my lifestyle as a part of Western society. Burtynsky uses photography in its traditional sense to capture reality, so in his series *Oil* (ongoing: 1999-present) he makes us reflect on the landscape resulting from extracting and refining oil. He also focuses on the dual nature of automobiles as symbols of freedom and of great harm, seen in his photograph of rolling hills composed entirely of old tires (Fig. 13)(Burtynsky, 2013). His photographs evoke many emotions: sadness, disgust, anger, guilt, and awe; they are a visual essay on our responsibility to own up to our collective impact. This emotional response to his expansive photographs calls upon the sublime in spite of their negative connotations. Burtynsky's images can positively inspire activism for making a change and improving our role on Earth through the awe they invoke. That is a promising result, because we are struck by what we see, and have hope for a transformation we can all support. My artwork includes factual information both positive and negative, but I hope that the message can be partially encouraging. These problems are happening, but by becoming informed about them we are better able to find solutions.

Alexis Rockman (American, b. 1962) is a contemporary painter. His painting *Adelies* shows a group of penguins adrift on a tall, isolated iceberg. This piece is part of his series called *South*, based on his time in Antarctica (Fig. 14). The imagery comments on the way we are effectively cornering species like penguins when we alter the extreme habitats they call home. Rockman has many other works that call attention to environmental issues, especially industrialization and mass production. His series of paintings *Wonderful World* portrays farm animals and produce in a grotesque, hyper-real way (Rockman, 2015). They are representative of the food they will soon become, bred to be store-ready for mass consumption. This calls attention to the control we try to

enforce upon Earth, upon its plants and animals, as a result of our impact on the climate. We manipulate the natural world to best serve our society. I am influenced by Alexis' ability to call attention to human folly; I think it is really important to call attention to our faults and how rooted our society is in mass consumption. The topics he addresses may be those that we would rather ignore, but his artistic style challenges us to give them attention. While this approach through grotesque style is not akin to my own, I think the context it provides is an essential, influential, and powerful tool that artists can wield.



Figure 14. (left) Alexis Rockman painting (VanishingIce.org, 2012).
Figure 15. (right) Claire Johnson painting (Johnson, 2013).

Claire Johnson (Thai-American, b. 1957) has a series of watercolor wildfire paintings, circa 2013. They are almost abstract in their simplicity, yet they manage to convey strongly the mood of helplessness associated with the large-scale fires becoming ever more frequent and intense in size across the United States. The trees and the fire engulfing them appear minute relative to the plume of smoke obscuring the sky. She allows a wash of paint, which composes the landscape, to drip as if it is melting away (Fig. 15). She uses scale to highlight the action taking place, so that the entire series of

different fires reminds us that these events are not singular. I have also been using series to tell a narrative more strongly. Numerous images about one theme can depict conceptual variations, whereas one image with many ideas may be too complicated to understand.

Toni Hamel (Italian-Canadian, b. 1961) describes her work as, “illustrated commentary on human frailties.” Her current body of work, titled *Land of Id* (2015), is still in progress and I think it is her strongest conceptually. This series uses symbolism to mock humanity’s destruction of the planet we live on, revealing the irony of how we interact with the natural environment in unnatural ways. Her pieces may be beautiful, but they quite clearly display negative meanings and make us uncomfortable, highlighting the abuses of other species and climate in very clever ways. She uses the popular phrase “Keep Calm and Carry On” as the title to a scene where figures appear to be trying to farm a barren land, ignoring the volcano smoking behind them. Another work uses the title “The Cove” after the documentary about the hunting of dolphins. In this painting people have trapped a group of narwhals and are preparing to spear them (Fig. 16)(Hamel, 2015). This serves as a commentary on both the way we have killed species past a tipping point, and also the way we are confining species that rely on cold climates as the planet warms. This scene may appear similar to a traditional hunt, yet the men do not appear native in their dress, making me think that this may also comment on appropriation of culture. These men may be practicing similar hunting techniques, but they are not native, and are hunting to kill rather than for sustenance. Because the narwhals must surface to breathe the men effectively capture them in a confined area, similar to the way Japanese hunters use nets to trap dolphins as seen in “The Cove.”

Morey's work raises many moral and political questions in painful but very successful ways. Her use of cultural references makes her work satirical and puts the blame on humanity. I am inspired by the efficacious communication of concept in Hamel's paintings through these references and the illustrative quality of her work: the combination of real and fantasy to tell a story.

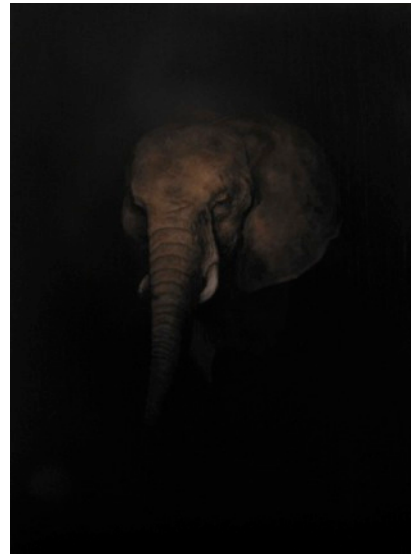


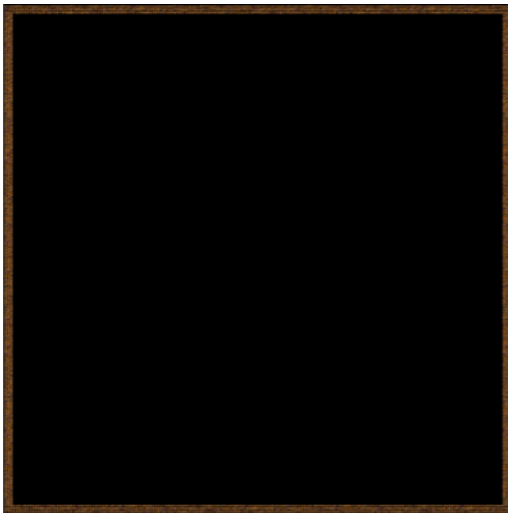
Figure 16. (left) Toni Hamel painting (Hamel, 2015).
Figure 17. (right) Brad Woodfin painting (Woodfin, 2015).

Often art can evoke an emotion or portray a message to the viewer that may not reflect the intent of the artist. Brad Woodfin's (American-Canadian, 1970) 2015 show *We are the Flood* is a series of oil paintings of individual animals emerging from dark canvases (Fig. 17). The way they blend in with the deep black behind them is haunting, and because of this my initial thought was that the work represents species fading as their populations become stressed due to habitat destruction and climate change. The lack of environment also conveys a sense of isolation: humans have altered the way animals live so significantly that they no longer have reasonable homes, and are left in a void of extinction. This reaction is not one revealed by the artist, simply a story imagined from

the perspective of an environmentalist. There is certainly a beautiful quality to these paintings that also reveals the diversity and complexity of animal form, better highlighted without an environmental context. This relates again to my consideration of simplicity as way to convey a message, and also creates a focal point. Because I want my artwork to evoke emotional responses, I am influenced by Brad's removal of the environment in order to make the animals feel more personal and individual.

Chris Jordan (American, b. 1963) compiles the thousands of his photographs, or his photograph repeated thousands of times, into new images, using conceptual compositions to create extremely powerful imagery. His work is done from an environmental conservation standpoint, and highlights the importance, yet dearth, of awareness and understanding of our impact on the natural world. Common themes are mass consumption, waste, environmental damage, and the rapid decline in many species. He also compiles his photographs to form cultural references, such as Van Gogh's *Starry Night*, and Katsushika Hokusai's *The Great Wave Off Kanagawa*. One example is *Gyre* (2009) which reimagines *The Great Wave Off Kanagawa* with bright bits of trash falling from its crest. The image is composed of 2.4 millions pieces of plastic, which are the approximate amount, in pounds of plastic, that enter the ocean every hour. The plastic in the wave, which Jordan photographed, was collected from the Pacific Ocean. Another example is his piece *Year of the Tiger* (2010), which depicts 3,200 toy tigers lining the outside of a large black square, like a frame (Fig. 18). 3,200 is the total estimated 2010 population. The large empty black area is the amount of space left when 40,000 more tigers inhabited the earth in 1970 (Jordan, 2015). His exhibited photographs are very large, and one scene must often be spread out over several panels. The scale of his work

reflects the astounding quantities of waste that Jordan is conveying, and allows the viewer to comprehend the often devastating impact of mass consumption. His ability to capture this topic so well is influential to me. Some of my artwork is about reminding us to be aware of the natural world and of our impact. But while billions of people have a collective negative impact on the environment, we also can have a collective positive impact. I want to use my art to also promote this optimism that as a whole humanity can shift our treatment of Earth's resources.



Figures 18. (left) Chris Jordan photographic compilation (Jordan, 2015).
Figure 19. (right) Crystal Morey sculptures (Morey, 2015).

Crystal Morey's (American, contemporary) sculptures explore the effects on our psyche from the destruction we have caused to the environment. She uses the idea of cohabitation to highlight particular issues of our ecosystem. Her sculptures are human forms incorporated into animal forms, with poses that often portray a strong emotion (Fig. 19). Morey uses this body language to give the message that all species are equal cohabitants of Earth. She researches topics such as habitat stress to strengthen the concepts in her work, focusing on the relationship between human and environment. This

interaction is woven into a narrative that is visually beautiful and poignant. A strong sense of empathy is captured in her clay sculpture, revealing the intimate relationships between humans and other animals. Crystal describes her intent to promote conservation with these sculptures about humans' role in the natural world, taking inspiration from, "Native American ceremonial masks and regalia, Byzantine and Renaissance devotional painting, secular portraits and altarpieces, and Egyptian antiquities," (Morey, 2015). The influence from past cultures means that her pieces are meant to be spiritual, like the historical talismans and totems of tribal cultures. In my own work I want to impart the relationship I have with nature because it is so strong: if I can convey this through my artwork then perhaps viewers will be inspired to also pursue a closer relationship with the environment. My work does not draw open the spiritual, but does pay homage to the magnificence of nature.



Figures 20. Zaria Forman pastel (Forman, 2015).

Zaria Forman (American, b. 1982) is an artist who works primarily in pastel, drawing large-scale landscapes. She has travelled extensively and in recent years her

work has focused on addressing climate change by depicting changing environments in the Maldives, the Arctic, and the Antarctic. She led *Chasing the Light* in 2012, an expedition inspired by her mother and the American painter William Bradford. This trip was a sailing voyage following Bradford's past route along the Northwest coast of Greenland (Forman, 2015). The artwork that resulted from this experience seems to have fueled her drive to document climate change. Forman draws from photographs (usually her own) and her compositions transform an iceberg or a crashing wave into an emotional landscape of these transmutable objects. These attributes, and the large size of her work, create a grandeur that captures the absolutely majestic scale and beauty of places. Her mission—to share these regions and the rapid changes they are undergoing—is inspiring. Her pastels inspire me to capture the indescribable beauty of nature while also showing that these places are changing, and, in a sense, disappearing.

My Collection of Artists

Researching so many artists over the past year has been extremely inspirational, and made me feel part of a tradition of passion and caring about our world. I now continuously discover more and more influential work in a snowball effect. The group I chose includes those who were truly a part of my investigation, and those whose work gave me inspiration for concepts or techniques. Many of those examined here will inspire me beyond the scope of my thesis.

The selection of notable historic works included in this paper proves how rewarding it has been to view the progression of environmental art. This research is important and very interesting to my understanding of the field. The technicality and

scientific value of natural art and illustrations from the 16th century inspire painters in the 21st century. The clear importance that art had in relation to scientists is inspiring because art has the potential to continue this role in the present. The continuum of art in science shows us how powerful art has always been as a tool for communication. I view the skill of observation as the link between these disciplines; it is necessary in order to excel in either. The artistic influences I gain are similar from both past and present eco artists. Current artists use many diverse styles, and since these styles more closely reflect my own, I have focused largely on this group.

I separated my artists into three categories: historical, those who share science, and those who depict human impact on environment. These groups are not strictly separate, with many influential approaches spanning several collections. Giovanna Garzoni and Maria Sibylla Merian inspire me as feminist role models. They both were able to choose a life of travel and art rather than family and marriage, in a time when this would have been nigh on impossible. They proved themselves to be capable and skilled artists, and scientists. Garzoni, Burtynsky, Rockman, and Jordan all strive to depict reality, whether beautiful or ugly. I am very inspired by the way artists Merian, Susemihl, Pomereu, Johnson, and Woodfin use aesthetic simplicity to convey a narrative and a focal point. Drury integrates data effectively, Breashears highlights change, the Harrisons use creativity to tackle problems and find potential solutions, and Hamel and Morey combine reality and fantasy in an illustrative approach to addressing climate change conceptually. Additionally, Aldrovandi expresses his fascination with nature through fantastical objects both real and imagined; Hamel and Jordan use symbolism and cultural references to

highlight human fault; Forman and Burtynsky capture the sublime in nature with vast landscapes. These specific techniques and styles have inspired and shaped my work.

It has been essential for me to learn about the broad field of environmental art in order to learn what already exists, how my work can relate, and what I can contribute. My career path is being shaped by the plethora of opportunities and artists I have uncovered in this process. I am aware of possibilities, processes, and approaches, and am encouraged to learn how extensive this field is. I think that I can bring something new to this group of creative thinkers, and will continue to link art and science through my role in each.

Artwork

I began to develop my environmental portfolio with field sketches at the age of 16, when I first participated in scientific fieldwork. I carried colored pencils, pens and a small sketchbook with me as I helped conduct research in the North Cascade Mountain Range in Washington. Ever since then, after seven field seasons with the North Cascade Glacier Climate Project (NCGCP), one field season in Antarctica, one field season in the Falkland Islands, and many hiking trips, I have amassed a collection of these small landscapes. Individually, they are quite simple paintings and drawings of lakes, glaciers, and flowers. As a collection they are a story of my travels. These sketches inspired the environmental artwork that I have created ever since. The field experiences provide the context for appreciating and understanding our natural world. The knowledge I have accrued in classrooms in the Earth Science Department, in books, and online, has provided me with content for this art. My challenge over the last several years has been

learning how to convey what I learn through my artwork. I want to share information with people in an engaging way. I see my art addressing both positive and negative messages about our environment. We should know what changes may take place and how they will affect us individually or as a species. I also want to spread information about affirmative actions that can help lead us to a more environmentally protected and conscious world. The art for my thesis is an instrument for scientific inquiry: highlighting the current changes in our climate to promote environmental awareness. The scientific topic I have focused on for this body of work is human-induced climate change.

Field Sketches

My father founded the NCGCP in 1983 in order to address the need for a continuous alpine glacier monitoring program in the United States. Every August since, he has worked on the same group of ten to fifteen glaciers in the North Cascade Mountains of Washington, mapping, measuring, and calculating their retreat, mass balance, profiles, and stream discharge. I have participated in the project from 2009-2015, and from 2012-2015 I have conducted my own small research project during the field season. I make crevasse measurements on the glaciers to delineate climate change. By measuring and mapping the size and distribution of crevasses I can record how crevassing changes on a retreating alpine glacier: crevasses become smaller in size and decrease in number. It is important to monitor the way a glacier and its ecosystem shift in response to climate change, while that change is taking place. In order to study the retreat, I use the measurements I take, along with data recorded by the NCGCP for the last 31 years, and aerial photographs of the glaciers from the 1960's and 1970's. I will continue this project in future field seasons. I have created several watercolors based on

photographs of the team and myself working on glaciers, including one of me using my Cam-Line measuring tape to determine crevasse depth (Fig. 21).

I have created dozens of field sketches during my seven years working in Washington. These have strengthened my observational skills and watercolor abilities. Creating art on site teaches me true awareness of my surroundings, and increases my perceptions of color and light. Artists like Edward Adrian Wilson remind me that the process of repeatedly making this art develops another relationship with my surroundings. I notice the whole ecosystem as I am sketching: plants, animals, mountains, glaciers, and streams.



Figure 21. (top left) Small figure in front of diminished Sholes Glacier, Mt. Baker (2015). (top right) Measuring the depth of a crevasse using a Cam-Line measuring tape (2014). (bottom left) Camp by Denton Glacier in Wright Valley, Antarctica (2013). (bottom right) View of West Falkland hills and cirque (2015).

When I choose environmental topics to depict in art, I am drawn to those that have personally influenced me. My field sketches and most of my portfolio, discussed

below, result directly from my own research involvement. Although I have begun to challenge myself to portray research I have not participated in, most often the issues I can convey most passionately are those I have experienced. I think this idea is also significant when considering imagery that will influence viewers. A glacier is beautiful and elicits emotions from someone like me who has climbed many, but for someone who sees them as a distant concept, they may be a less relatable image. I often incorporate wildlife into my work, and I have noticed that people respond well to this. I believe that people can become informed about our changing climate without feeling hopeless. I don't want my artwork to be too pessimistic because this attitude does not necessarily instill a desire to help. While my art will reflect reality, I hope to use it to encourage people to make a difference, showing them that it is certainly not too late to do so.

Take a Lesson from Nature: Recycle

My diptych on recycling appears to be a nice woods scene at first glance; but the piece transitions in the first panel to the next, from forest to clear-cut woods. The more you choose to engage in this piece, the more you will see and understand the message. I recycled materials into this painting: found bark, leaves, and feathers. Many of the feathers were from the remains of a bird that had clearly been hunted down. I collected newspaper scraps, images in magazines, text and diagrams from a geology textbook. These papers were painted with transparent washes so that they recede and become unified as a landscape. I incorporated text that can be read in the painting, and the words speak of paper usage, trees, and recycling. If the viewer stops to read the text, they will learn the amount of trees we cut down each year, how much paper we go through daily,

and how our recycling rates are improving but still have far to go. The title for this piece, *Take a Lesson from Nature: Recycle* was chosen as a result of the content of my image. The forest floor is composed of continual growth and decay; the bird in the foreground picks up material from it for its nest. All of nature is made up of cycles, thus the lesson humans should take is to respect these continual processes by reusing and recycling. While the image may initially be seen as a pretty landscape, I think it is immediately evident by the presence of all the stumps that the environment is split between positive and negative. If we take care of our ecosystem then we can preserve the natural cycles. Many times when trees are clear-cut, there are no attempts to re-plant. And often trees cannot naturally regrow again without help because the land becomes so exposed. Instead selective cutting could be done. This is the sort of informational story I would like to convey in my work: the problems and the solutions.



Figure 22. *Take a Lesson from Nature: Recycle*. Acrylic paint and collage (2014)

Support Marine Reserves in the Antarctic

I usually begin a new piece or series by choosing a specific topic I am motivated by and researching it to figure out how to illustrate it in a way that will impart a message.

After visiting the Antarctic I was even more interested in reading about the continent, and the environmental concerns it faces. I saw a video by the Antarctic Ocean Alliance that highlighted the need for areas in the oceans surrounding the Antarctic to be set aside for species that need preservation (Antarctic Ocean Alliance, 2015). I chose to do a series of three monoprints that each show a different issue that Antarctic wildlife faces. The first piece is titled *Support Marine Reserves in the Antarctic: Overfishing*, because many species of fish are threatened by fishermen taking too much too often. Fishing lines extend into the water and ensnare the waiting fish, while Adelie penguins stand atop the iceberg, unable to stop the depletion of their food sources. *Support Marine Reserves in the Antarctic: Bycatch* shows a net ensnaring the tail of an orca. Overfishing results in much more frequent accidental bycatch of species not meant for food, who are often killed in the process. The final image highlights the overarching issue that will continue to threaten the way of life for all species: *Climate Change*. In each print the icebergs on the surface of the water shrink, and the sea level rises. Also in each print I included three species of penguins which live in this region and that will lose much of their habitat: Adelie, Emperor, and Chinstrap. This series appears to simply be a beautiful glimpse of the Antarctic sea ice, but when viewed more closely is meant to reveal the way humans are endangering many species. This series is the story of a changing landscape, using simplification of form and color to elicit an emotional narrative. Artists Toni Hamel, Chris Drury, and Claire Johnson inspired my illustrative approach. We should do our best to keep these areas as pristine as they are if we want this beauty to remain. If we create reserves the wildlife will have much better odds against climate change; if we continue to interfere with their habitat by over-fishing, these areas may never be the same.



Figure 23. *Support Marine Reserves in the Antarctic*. Monoprint and watercolor (2015).

Washington Climate Change Series

During my seven years with the NCGCP, I have never seen as much devastation to the glaciers as I have this past season (2014-15). Neither has my dad, Dr. Mauri Pelto, who founded the project 31 years ago. The drought in the West has been crippling to ecosystems as a whole, and in the mountains snowfall was nearly non-existent. Even when there was precipitation, warmer temperatures caused the snow line to rise to an average of 6000 feet, from its previous average of 4200 feet. Our field team encountered bare ice and spent many hours wearing crampons, with little snow to paint the glaciers in their usual majestic colors. The dirty, debris-covered ice, and massive loss of volume of the glaciers was just the beginning. New lakes are forming that didn't exist when I joined the project in 2009, the usual August wildflowers were all past their peak, fall colors occurred instead, rivers and ponds that rely on snowmelt were low or dry, and haze from forest fires made it hard to see and breathe. Our team wondered how ice worms, which

thrive in snow and cannot survive on ice, would fare without the snow for an extended period. Never have the effects of climate change been so evident to me, or affected me in such a way. After spending so much time in these mountains I have formed a strong connection to them, and I know their glaciers well. To see huge fields of newly uncovered bedrock and till (clay, sand, gravel, boulders) made me very sad, and revealed the reality of the onset of a different climate. It also made me appreciate my luck in seeing these magnificent glaciers now.

Upon my return, I wanted to create art about some of the major impacts of global warming that I witnessed, while the memories were still painfully fresh. I developed a three-part series in printmaking using scientific data to show how the drought is devastating the state. In *Salmon Population Decline* I used population data about the Coho species (Pelto, *From a Glacier's Perspective*, 2015). Seeing the rivers and reservoirs looking so barren was frightening; the snowpack in the mountains and on the glaciers supplies a lot of the water for this region, and the additional lack of precipitation has greatly depleted the state's hydrosphere. Consequently, the water level in the rivers the salmon spawn in is very low, and not cold enough for them. In *Decrease in Glacier Mass Balance* I use NCGCP measurements from 1980-2014 of the average mass balance for the glaciers we study (Pelto & Brown, 2012) (WGMS, 2013). Mass balance is the annual budget for the glaciers: total snow accumulation minus total snow ablation. Not only are mass balances consistently negative, they are also continually decreasing. *Increasing Forest Fires* uses global temperature rise information from Climate Central (Climate Central, 2015). Fortunately, I was not near any of the massive forest fires that raged before, during, and after my two weeks in Washington this summer, but I was greeted

with many smoke-filled days. On some days, when the winds blew from the fire toward us, the smell and taste of the smoke overpowered my senses, even though the fire was about 100 miles away. As temperatures increase, and drought or even drier than average conditions persist, forest fires become a huge threat to the forest, plants, animals—and of course to people and structures.

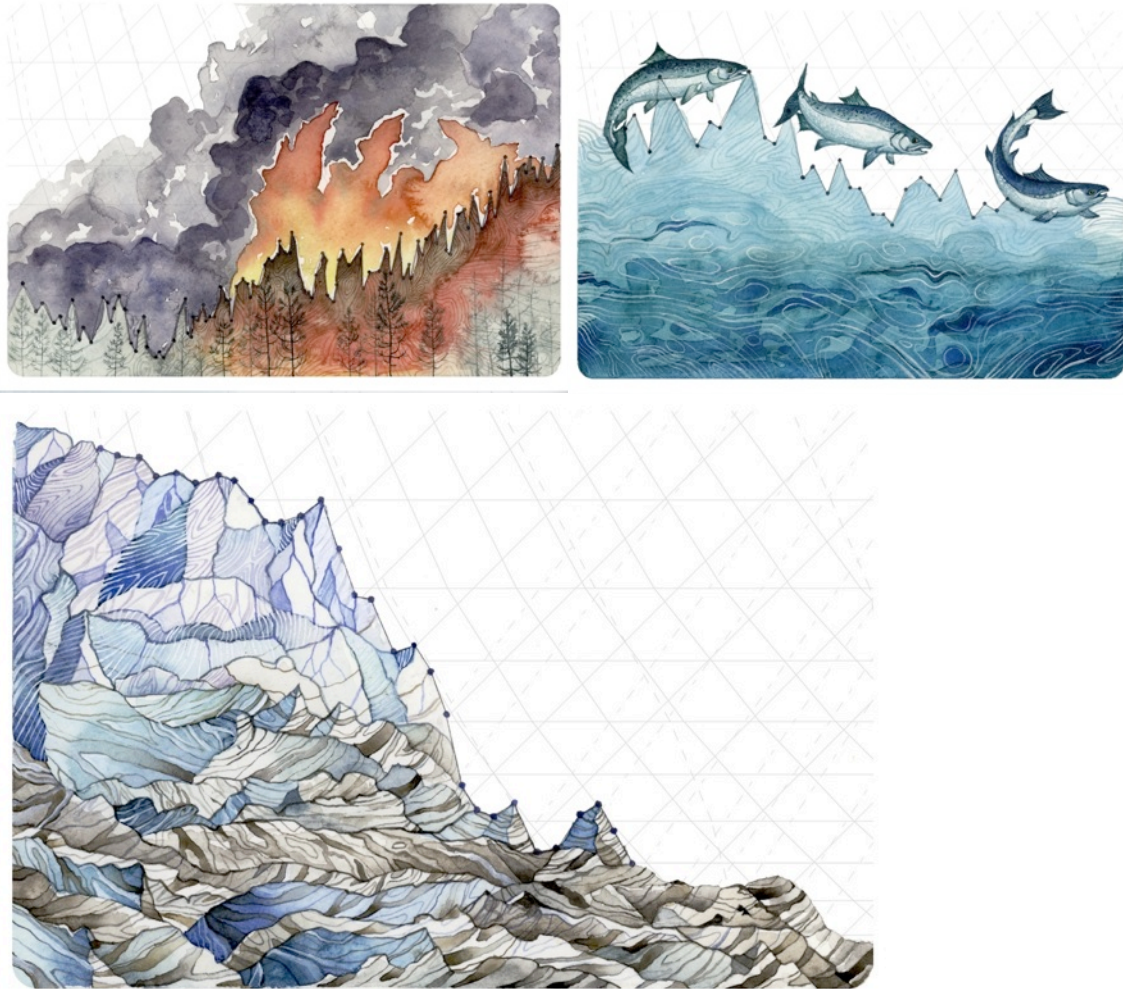


Figure 24: *Washington Climate Change Series*. Watercolor (2015).

Integrating Climate Change Data

My 20” x 25” print *Climate Data* uses multiple sources of information. I depict quantities for the global glacier mass balance annual decrease, global sea level rise, and

temperature increase. I also used a timeline for human influence at the bottom of the image: 1880-2020, beginning at the industrial revolution and extending into projections for the near future. The arrows on the side show the increase in sea level and the decrease in glacial volume with respective values for each. The sea level may have been rising since the last glaciation, but the continued rate of rise due to increasing global temperatures is unprecedented. The same is true of the glaciers: the current loss in ice volume is unnatural, which is why I illustrated the ice sharply declining into the water, with icebergs calving and melting. The suns that arc across the horizon coincide with the 1880-2020 timeline: each contains the increase in temperature occurring in the year below on the timeline. My inspirations for this piece were based on research I have been able to contribute while working in the Climate Change Institute on campus. I assisted with fieldwork in the Falkland Islands, directed by Dr. Brenda Hall, where the goal is to produce a well-dated chronology of glacier recession in the Falkland Islands following the Last Glacial Maximum. These islands lie in a climatically sensitive location that should be highly responsive to any rapid warming. Numerous glacial features such as moraines and cirques exist, but none have been dated.

Moraines are accumulations of sediment debris that are deposited by glaciers. Cirques are circular hollows formed by glacial erosion of mountain walls. Dating these features will help provide estimates of past climate variations. In the field I was able to observe Dr. Hall mapping former ice margins, help by collecting rock samples for beryllium-10 dating to define the ages of the glacial deposits, and learn about producing a chronology by coring pond sediments in areas formerly covered by ice, to obtain the oldest organic materials (Hall et al., 2013). Assisting on this project helped me develop

an understanding of what it means to determine the dates of materials. It became clearer how much work must occur before scientists can begin to piece together past events. Scientists study what happened largely to understand what might now happen as a result of human-induced climate change. I wanted to convey in an image how all of this data must be compared and linked together to figure out the fluctuations in Earth's natural history. I represented this by trying to illustrate that glaciers are melting and calving, sea levels are rising, and temperatures are increasing.

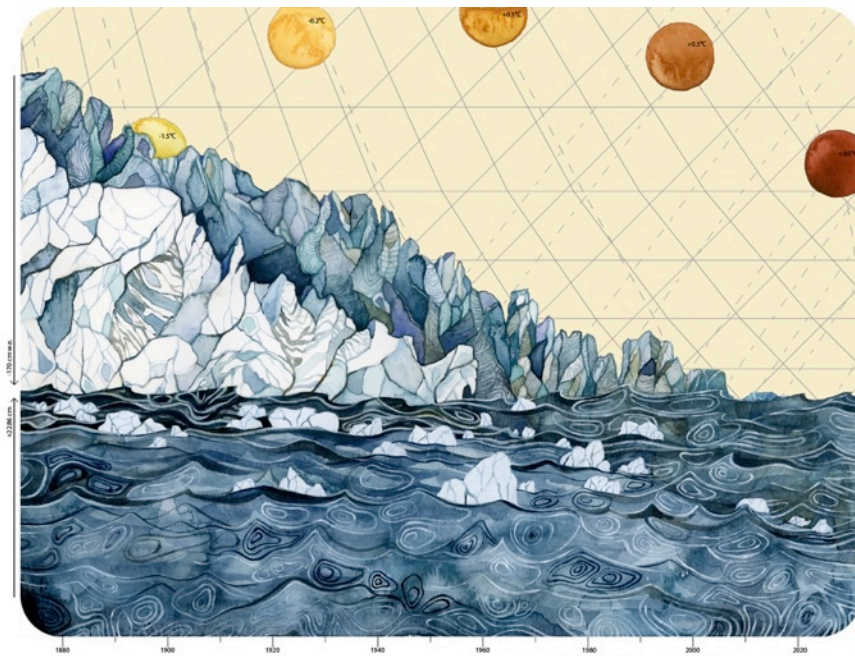


Figure 25. *Integrating Climate Change Data*. Watercolor and Adobe Photoshop (2015).

Habitat Degradation Series

Series in art can be very effective in conveying a broad topic. Each piece can focus on a particular issue, but as a whole share a theme that communicates a larger concern. I chose to do a series on habitat degradation so that I could highlight the fact that currently there is devastation in every single ecosystem on Earth. People make messes every day that they don't clean up; these messes have serious consequences and unseen

repercussions. The destruction we are causing on nature is negatively impacting all life, and we tend to forget that devastating events are happening when we cannot see them. While we should not always dwell on the negative, being positive is different than forgetting, or not acknowledging, that something is wrong. *Habitat Degradation: Deforestation* zeroes in on the clear-cutting of rainforests. The data shows the very rapid decline in rainforest area from 1970 to present (Connect Green, 2010). These lush ecosystems are disappearing before our eyes, and with them, millions of beautiful species. I'm quite certain that anyone would agree that a tiger is a magnificent creature, yet how many people realize that they are critically endangered (WWF, 2015). For this series I chose to separate the animals from their habitat, because that is ultimately what we are doing. The tiger is trapped outside the forest, cornered. He is defensive and angry that we are sealing his fate. The data in this image blends in with the scene a bit more. Yet it represents the separation, this line that species cannot cross.

Habitat Degradation: Arctic Melt shows Arctic sea ice data from 1980 to present. Rapid warming in the Arctic has caused the sea ice area to decline so quickly that species cannot adjust. The polar bear is a great, known symbol for this perilous melt. Since other species, both land and marine, also make their home in this extreme climate, I wanted to choose a different representative. The Arctic fox is small and extraordinarily resilient to the most severe cold. They can withstand the frigid north and thus have this corner of the world in which to hunt. But when the temperatures mellow, competition from larger species could overcome them, as other species move further north to escape their own warming environment (NatGeo, 2015). There are lots of ecosystems around the world that are very unusual and isolated. The poles harbor so many unique forms of life, which

have been able to survive because their competitors cannot withstand those conditions. Causing warming in these areas will confine all of these species drastically. This is a similar idea to that in Toni Hamels' painting *The Cove*, where men with weapons corner the already stressed narwhals. I painted the Arctic foxes to look cornered and skittish. One is hunched and defensive, the other is yowling in panic. The sea ice, from which they are separated, is spaced out by large expanses of dark blue water absorbing the sun's heat.

Habitat Degradation: Ocean Acidification is the third piece in my series, and contains ocean pH data from 1998 to 2012. The decreasing pH is due to atmospheric carbon dissolving into the ocean, and creating carbonic acid. A decline in pH means a more acidic ocean, with harmful effects on all marine life. This continuously increasing acidity has already damaged many species. It impacts chemical communication, reproduction, and growth. Coral reefs, shellfish, urchins, starfish, zooplankton, plants, algae, and fish are all being stressed by the current acidity. A continued drop in pH will be very detrimental to them (Bennett). I chose a group of clownfish for the representative ocean species, primarily because nearly everyone is familiar with them, but probably do not realize that they are in danger. Ocean water has a lower pH than a fish's cells, so they take in carbonic acid in order to be in harmony with their environment. Even a small drop in pH requires fish to expend much more energy in order to equilibrate, and this energy is taken from other necessary functions such as digesting, escaping predators, catching food, reproducing, and growing. I also chose clownfish because studies on them in more acidic water reveal that the changing pH alters how their brains' process information. It affects their ability to avoid predators by detecting noises and find their way home via

“smell” (Bennett). Reading more extensively about this topic is very scary. If the acidity in the ocean drops much more, many species may be greatly damaged and depleted. The clownfish in my watercolor are grouped in confusion, separated from the anemone in which they live. The oceans may be vast, but if pH drops globally, there is literally nowhere marine life can go, since they are confined to the water.

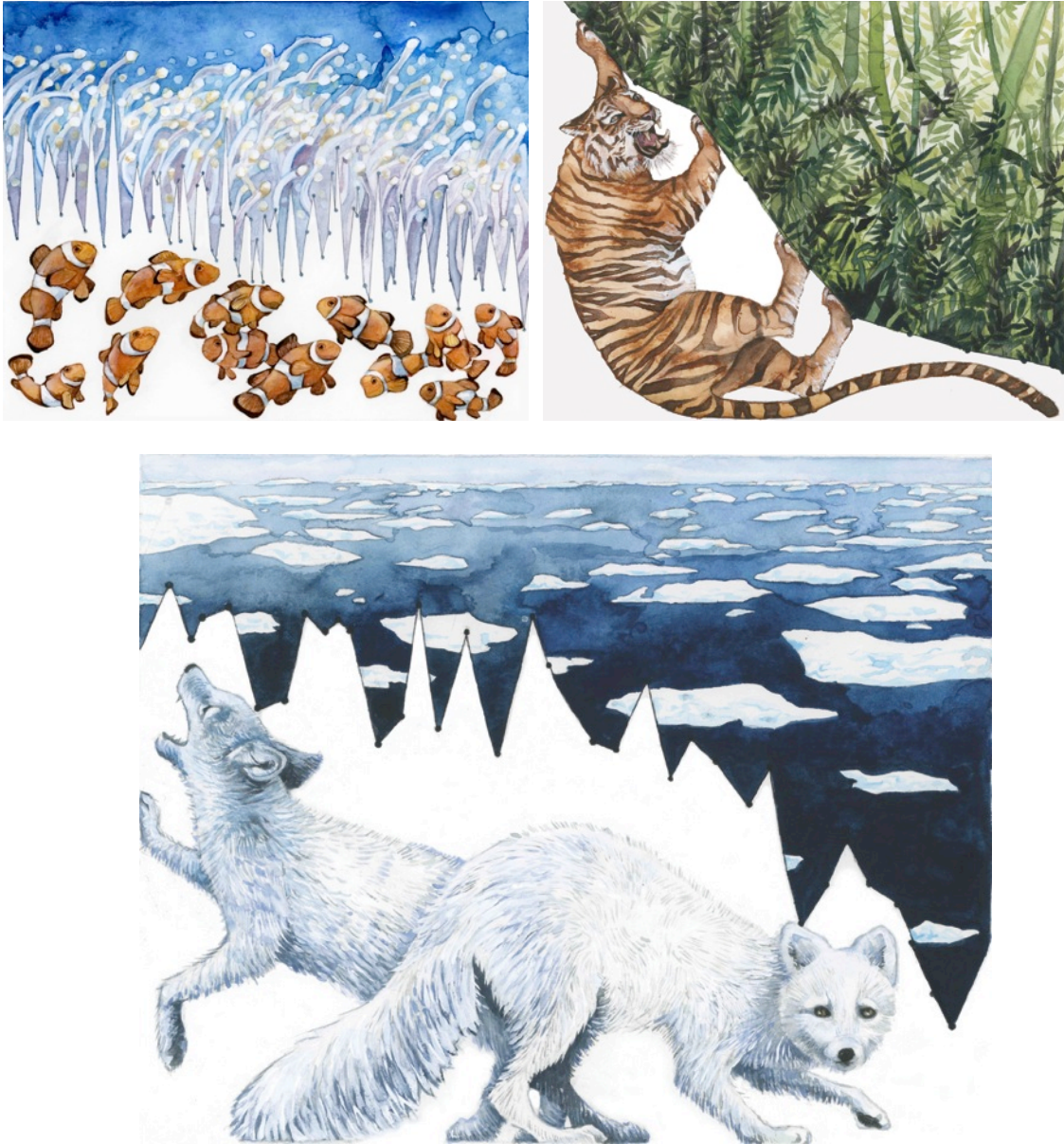


Figure 26. *Habitat Degradation Series*. Watercolor (2015).

Moments of Observation Diptych

I believe that spending extensive time in nature encourages the development of observation. This is the theme of the large canvas diptych I painted, *Moments of Observation*. One panel shows a group of five people standing in a row, with mountains behind them. The other panel shows what they are looking at: a large mountain covered in glaciers. They are wearing reflective sunglasses and within them you can see the image of the glacier landscape. Below the glacier I created graphical lines denoting where the glacier used to extend, only several decades ago. This data is also reflected in the glasses, because the people are observing these drastic changes. The people are standing quite still and solemnly because they are taking the time to look and to reflect. Each of them may be noticing a different change in the glacier, but they are all taking in its retreat. Within both paintings I incorporated text that I found in magazines and a textbook. Most of it is legible, and when you step up to the canvas you can read both positive and negative factual information related to the environment. There is a broad spectrum of subjects but each of them is united under one message: pay attention to what is happening on our world. There are many different pieces of text that you can read on both canvases, and I hope the viewer will be drawn into the image to read parts of it. Likewise, it is only possible for us to stay informed about a small portion of what happens on Earth. Yet, the key is to try to be aware, open to learning and understanding. The majority of the text is collaged at the terminus of the glacier. It is piling up there, like debris that has moved and been carried along by ice and meltwater. Pieces overlap and topics relate or contrast, some words pop out, and others are used in graphs. As the ice continues to recede, more of these texts, representative of more issues, would emerge. When an alpine glacier

quickly melts, it leaves behind a mess of rocks mixed with the sludge from saturated glacial flour (ground rock). It creates a treacherous zone where any step could give way to a boot filled with mud. Other muddy areas deceptively cover ice, creating slippery surfaces. The text is symbolic of this zone: full of unforeseen consequences and misplaced steps. I display these two paintings perpendicular to one another, because the five figures are looking across at the landscape. Hanging them this way also creates a space between both paintings that the viewer can enter. If the viewer looks at the figures, then follow their gaze, they will begin to observe the landscape. If they decide to stop a moment and engage further with the piece, they may understand the significance of the data lines indicative of glacial retreat, or the context of the written scraps. Since each of these paintings are 36" x 40", the figures are close to life size, allowing someone to put themselves into the piece. While I would like my technique to improve, I am very happy with the way I have been learning to integrate text into my paintings. I first did this with *Take a Lesson from Nature*, also with a painting (not included in the exhibit) about drought, and I am learning to place text with more meaning and consideration.



Figure 27. *Moments of Observation*. Acrylic and collage (2015).

Thesis Portfolio

I have been struggling with how to communicate scientific topics in my art for several years. When I first began my Thesis, I knew that I wanted to develop a strong body of work to combine my skill sets and create a cohesive style. I also knew that I wanted my work to be conceptually strong. I have spent the past year focused on creating ecological art to meet these goals. I used sketchbooks to brainstorm: writing my thoughts, words that could inspire imagery, and creating a lot of thumbnail sketches. I think that both my graphical and my collaged, textual work are great starts to a strong environmental collection.

The works listed above are those that I have selected to compose my Thesis Project portfolio. Some are stronger than others, which show my progression as an artist during this investigation. Learning how to incorporate text and data into my artwork was my goal and has become an essential part of my current portfolio. I believe that my approach to this combination is both aesthetically pleasing and informative. I strove to integrate some of the many influences discussed in my collection of artists: depiction of reality, simplification, integration of data, displays of change, providing solutions, elements of fantasy, and symbolism. These choices helped strengthen my own work immensely and helped ensure its successful communication. This reaction of success is also based on feedback from my peers in their understanding of the topics presented.

During this Thesis process I have thought a lot about how to share information with the viewer. *Take a Lesson from Nature: Recycle*, *Support Marine Reserves in the Antarctic*, and *Moments of Observation* are works inspired by artists such as Toni Hamel, who uses story-telling tactics in an illustrative way. My graphical artwork also has these

components with the addition of data, as seen with Chris Drury and the Harrisons. The references to graphs may not initially lead a viewer to the correct interpretation of my art, but it will get them thinking. The titles of my pieces also help provide the viewer with some clues. I tried to push myself to create as many pieces as possible, while still producing quality artwork. I did not include several paintings because they are not strong enough pieces for my final portfolio. I spent many hours developing ideas for each painting or print that I made; once I decided on an issue I would research it extensively. This allowed me to understand the topic thoroughly, which meant that my art could express that idea much more clearly. I searched for different graphs about each subject as well so that I was able to include one that fit the composition best. As whole I think the body of work I developed through the Thesis project reflects the time and effort I invested. My examination of environmental artists and scientific papers, in addition to my constant creation of new artwork, led to the formation of a strong collection of art about human-induced climate change.

Sharing my Artwork

I have pursued opportunities to present the body of work I have been developing. In March 2015, I, along with several other students, presented my creative research project to Tony DeRose and an audience in the Innovation Center. He is a Senior Scientist and Lead of the Research Group at Pixar Animation Studios. With Powerpoint images I discussed the scientific research I have been able to assist with in Washington, the Falkland Islands, and the Antarctic, and why these studies are so important. I concluded by sharing the studio art I have been developing to address scientific work and

environmental concerns. I received helpful feedback from the group about the direction my art was heading.

In June 2015, I attended the 72nd Eastern Snow Conference in Sherbrooke, Canada. I presented a poster with my research, *Baseline Crevasse Measurements on North Cascade Glaciers to Detect Climate Change*. I included my art prints as part of the display. My priority was to discuss my research project, so I kept my comments focused on science. However, I enjoyed it when I received questions and comments about the art. Most people appreciated that I bring field sketch materials with me, and expressed a desire to do the same. I explained that this practice helps strengthen my observational skills as a whole.

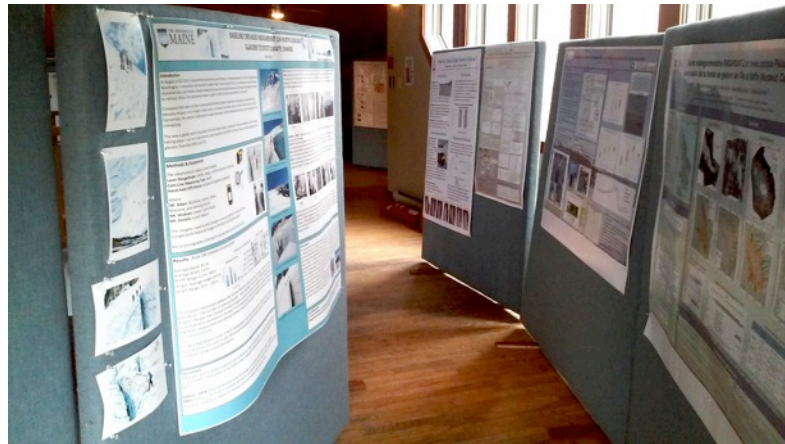


Figure 28. My Eastern Snow Conference poster on left, art prints displayed alongside (2015).

Creating art in the field has allowed me to think more about the communication of science and research as a whole. Attending the conference made me think about how I might incorporate my art directly with science. I think many scientists would appreciate their work being shared, so I have begun to make an effort to talk with more people in the UMaine Earth Science Department and the Climate Change Institute about their projects, and discuss ways that art can be an effective platform of communication for science.

Several professors, undergraduates, and graduate students have expressed interest in combining art and science, and I intend to pursue this further in the future.

In September 2015 I had an exhibition at the Rock & Art Shop in Bangor titled *Collected Works of Art and Science*. The show featured my paintings, prints, and an array of my field sketches. I included brief, written descriptions of the environmental and scientific topics of my work. I sold many small prints, and was able to talk with several dozen people about my artwork. Several art and science professors came and they also discussed with me the set up of the show and critiqued its installation, which I really appreciated. After the opening event I talked with Annette Sohns (a UMaine Studio Art alumnus) who runs the gallery space and co-owns the shop. She advised that I make my prints into cards, making them more marketable. This is a valuable idea because I could add brief descriptions on the card back about the environmental issues and provide a link for more information.



Figure 27. Me with a framed watercolor, and the display of my field sketches at the Rock & Art Shop Exhibition (2015).

Beginning to share my art this way has helped me learn how effectively I communicate the ideas in my art, and also how to promote my career goals as an artist. I have begun to share more of my work in order to spark discussions during class critiques and commentary amongst students and professors in both Studio Art and Earth Science courses. The reactions and feedback I receive refine my ability to communicate, and inform my choices for promoting my work and ideas. For example, I use the social media platforms Twitter, Facebook, and Instagram to share my work with peers, scientists, and artists. As a whole sharing my work across three different platforms allows me to experiment with the incredible power of social media, and consider alternatives to share my art across many diverse branches of knowledge.

As an artist my objective is to think of ideas, explore the concepts behind it, and develop a body of work that expresses that knowledge. I will continue to refine and develop ideas, build my technical skills, and strive to communicate to varying audiences the importance of environmental awareness.

Works Cited

- Antarctic Ocean Alliance. (2015). *What's At Stake*. Retrieved September 2014, from <http://antarcticocean.org/>.
- Bennett, J. (n.d.). *Ocean Acidification*. Retrieved October 2015, from <http://ocean.si.edu/>:
<http://ocean.si.edu/ocean-acidification>
- Breashears, D. (2008). *David Breashears*. Retrieved April 2015, from <http://davidbreashears.com/>.
- Breashears, D. (2007). *GlacierWorks*. Retrieved October 2015, from <http://glacierworks.org/>.
- Burtynsky, E. (2013). *Edward Burtynsky*. Retrieved October 2015, from <http://www.edwardburtynsky.com/>.
- Cargo Collective Inc. (2011, November). *Monstrorum Historia by Ulisse Aldrovandi*. Retrieved July 2015, from Cargo Collective:
<http://cargocollective.com/Kunstkabinett/Monstrorum-Historia-by-Ulisse-Aldrovandi>
- Climate Central. (2015, April 21). *Rise in Global Temps Since 1880*. Retrieved September 2015, from Climate Central:
<http://www.climatecentral.org/gallery/graphics/rise-in-global-temperatures-since-1880>
- Cobb, M. (October, 2001 8). *Bees, Ants and Other Social Insects*. Retrieved November 2015, from JanSwammerdam.org: <http://www.janswammerdam.org/bees.html>
- Connect Green. (2010, September 17). *Disappearing Stripes in the Year of The Tiger* . Retrieved October 2015, from <http://www.connect-green.com>: <http://www.connect-green.com/disappearing-stripes-in-the-year-of-the-tiger-v/>
- De Pomereu, J. (2015). *Jean de Pomereu*. Retrieved April 2015, from <http://www.jeandepomereu.com>.
- Drury, C. (2015). *Chris Drury*. Retrieved April 2015, from <http://chrisdrury.co.uk/>.
- EdwardAWilson.com. (n.d.). *Edward Wilson of the Antarctic*. Retrieved March 2015, from EdwardAWilson.com.
- Forman, Z. (2015). *Greenland 2012: Chasing the Light*. Retrieved March 2015, from <http://www.zariaforman.com/>.

Hall, B., Porter, C., Denton, G., Lowell, T., & Bromley, G. (2013). Collapse of Cordillera Darwin glaciers in southernmost South America during Heinrich Stadial 1. *Quaternary Science Reviews*, 62, 49-55.

Hamel, T. (2015). *Land of Id*. Retrieved July 2015, from <http://www.tonihamel.net/>.

Harrison, H. M. (2009). *The Harrison Studio*. Retrieved March 2015, from <http://theharrisonstudio.net/>.

J. Paul Getty Museum. (n.d.). *Giovanna Garzoni*. Retrieved December 2015, from <http://www.getty.edu/art/collection/artists/14049/giovanna-garzoni-italian-1600-1670/>

Johnson, C. (2013). *Wildfires*. Retrieved September 2015, from <http://www.clairejohnsonart.com/>.

Jordan, C. (2015). *Running the Numbers II*. Retrieved November 2015, from <http://www.chrisjordan.com>.

Linder, C. (2015). Retrieved April 2015, from ChrisLinder.com: <http://www.chrislinder.com/>

Meier, A. (2015, September 9). *A 17th-Century Woman Artist's Butterfly Journey*. Retrieved November 2015, from Hyperallergic

Morey, C. (2015). *Portfolio*. Retrieved July 2015, from <http://www.crystalmorey.com/>.

NatGeo. (2015). *Arctic Fox*. Retrieved October 2015, from <http://animals.nationalgeographic.com/>:
<http://animals.nationalgeographic.com/animals/mammals/arctic-fox/?source=A-to-Z>

Nussbaumer, S. (2015). *Mer de Glace – art & science*. Retrieved July 2015, from <http://www.geo.uzh.ch>: <http://www.geo.uzh.ch/~snus/glacier.htm>

Pelto, M. (2015, June 8). *From a Glacier's Perspective*. Retrieved September 2015, from AGU Blogosphere: <http://blogs.agu.org/fromaglaciersperspective/2015/06/08/salmon-challenges-from-glaciers-to-the-salish-sea/>

Pelto, M. (2015, August 20). *From A Glacier's Perspective*. Retrieved September 2015, from AGU Blogosphere:
<http://blogs.agu.org/fromaglaciersperspective/2015/08/20/disastrous-year-for-north-cascade-glacier-mass-balance-snowice-economy/>

Rockman, A. (2015). *Alexis Rockman*. Retrieved April 2015, from <http://alexisrockman.net/>.

Pelto, M. S., & Brown, C. (2012). Mass balance loss of Mount Baker, Washington glaciers 1990-2010. *Hydrological Proc.*, 26 (17), 2601-2607.

Vai, G., & Cavazza, W. (2006). Ulisse Aldrovandi and the origin of geology and science. *Geological Society of America Special Papers* , 411, 43-63.

VanishingIce.org. (2012). *Alexis Rockman*. Retrieved April 2015, from VanishingIce.org: <http://www.vanishing-ice.org/artists/alexis-rockman/>

VanishingIce.org. (2012). *Chris Linder*. Retrieved 2015, from Vanishing Ice: <http://www.vanishing-ice.org/artists/chris-linder/>

VanishingIce.org. (2012). *Edward Adrian Wilson*. Retrieved March 2015, from VanishingIce.org: <http://www.vanishing-ice.org/artists/edward-adrian-wilson/>

WGMS. (2013). Glacier Mass Balance Bulletin No. 12 (2010-2011). In M. Zemp, S. Nussbaumer, I. GartnerRoer, M. Hoelzle, F. Paul, & W. Haeberli. Zurich, Switzerland: World Glacier Monitoring Service.

Woodfin, B. (2015). *We Are The Flood*. Retrieved October 2015, from <http://www.bradwoodfin.com/>.

WWF. (2015). *Tiger*. Retrieved October 2015, from <http://www.worldwildlife.org>: <http://www.worldwildlife.org/species/tiger>

Author's Biography

Jillian Pelto was born in Worcester, Massachusetts on April 2, 1993. She was raised in Worcester County and graduated from West Boylston High School in 2011. She found an interdisciplinary track by double majoring in Studio Art and Earth Science. She is a Recipient of the 2015 Churchill Exploration Fund through the Climate Change Institute, had artworks selected for inclusion in the Dean's Exhibition in Stevens Hall 2013-15, and was awarded a Center for Undergraduate Research fellowship to study crevasses in North Cascades, Washington.

Upon graduation, Jill plans to attend graduate school beginning Fall 2016 at the University of Maine to receive her Masters Degree under Dr. Brenda Hall. She plans to build a career focused on the communication of science through art.