Capturing Climate Change: Investigating the Connections Between Environmental Science & Photography

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CAPTURING CLIMATE CHANGE: INVESTIGATING THE CONNECTIONS BETWEEN ENVIRONMENTAL SCIENCE & PHOTOGRAPHY

by

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ABSTRACT

A powerful symbiotic relationship is the one between photography and the field of environmental science. They coexist together in such a way that the progress of one inherently allows for progress in the other. The purpose of this thesis is to investigate and illuminate this specific link. From the earliest cameras, photography was able to capture small details that the eye wasn’t able to see. This ability gave scientists the opportunity to capture images of up-close cells, viruses, certain species, and more. As the popularity of caring for the environment increased, the technologies of science and photography grew alongside. The documentation of climate change, the impacts of pollution, and all the damage humans were causing pushed mass amounts of support towards environmental science. Public awareness made great reason for governmental change. Everyday around us there are consequences of human actions in terms of climate change, but it can be hard to see on a personal level. Photography captures this problem and forces us to acknowledge it. The average person can no longer ignore it because the documentation is right there. Scientists use photography to seize what they are seeing and support their theories. In environmental science alone, photography has provided the field with the ability to visualize detrimental changes in the world, discover new species, and monitor environments. This undeniable link is one which deserves to be further investigated to better understand how it can be harnessed to bring about change.
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PART ONE

INTRODUCTION

As a child I loved spending time outside, exploring in nature, and trying to understand exactly how everything in the natural world worked. I was entranced by the beautiful things I was seeing -- dappled sunlight through the trees, vivid sunsets, foraging animals, etc. There was a connection I felt towards nature, and I wanted to understand it. It all seemed bigger than me, but I knew I never wanted to lose that wonder. I can remember spending summer evenings running around outside catching lightning bugs in my hands just to watch them light up before my eyes. From my earliest days, I remember wanting to spend more time outside than inside, which to this day remains true. I had these phenomenal memories of things I was seeing when I was in the outdoors but was frustrated that I had no way to capture these wondrous scenes.

I got into photography at the age of six when my grandpa, who was a photographer, handed me my first camera. The pictures I took at the beginning were mostly quick blurps of my dog or unbelievably up-close shots of family members. I obsessed over that camera, taking it with me to the most random places, but it took me years to realize I could seize a specific important moment in a photograph. Right about this time, my love of National Geographic began -- I immediately loved everything the photographers were doing to get exactly the right picture. Soon, on every hike, even a simple walk around the block with my dog, I had my camera in my hands. Now, as I move into my final year of college, truly nothing has changed. I knew I
wanted my final thesis defense to combine the two fields I cared about the most: environmental science and photography.

Some may not realize the important connection between environmental science and photography. Photography helps show the public exactly what is going on in the world of environmentalism, whether or not they have previous scientific knowledge. It gives scientists the capacity to see a landscape almost 200 years prior to their time, making it seem vividly alive and giving them a window into exactly how much it has changed. The use of photography alongside environmental science created a specific sector of the photography world. The classification of “environmental photography” was soon recognized as a way to deeply understand our impact on this planet and became extremely useful. Environmental photography captured the effects of climate change on landscapes, animals injured in oil spills, smog in the air, and more.

To begin my thesis, I need to establish a timeline on the turning points in the field of environmental science. There is an importance in knowing how we have arrived where we have today in terms of action, awareness, and change. Many different policies have paved the way for environmental science, but to establish a clear focus, I chose to highlight specific, crucial events that I have learned about time and time again in my environmental courses. These occurrences struck me as extremely necessary in bringing up during the timeline because they provide background histories towards relevant photographic moments as well. Gathering the background of topics is important in order to emphasize just how drastically the field has changed, with its history teaching us how far we have come. The impact from the field of environmental science is clear; there is
nodenying the progress we have made as well as how the field has been able to adapt to our conditions.

Environmental photography is a sub-field of photography that is valuable to the public, scientists, and activists alike. There is a difference between environmental photography and landscape photography. Rather than aesthetically oriented pictures of terrains, natural settings, and panoramas, environmental photography focuses instead on specific areas that are impacted by climate change, have changed over time, or inhibit species. There have been massive impacts from photographers releasing images of just how drastically degraded different pieces of land have become. I will cover these impacts in chapter two in order to bring light to the importance of keeping this field of photography alive. If environmental photography was to disappear in this modern world it would not just impact photography, but would affect climate change scientists, take away public influence, and reverse some of the progress we have made. It’s pretty clear that environmental photography relates with the field of environmental science, however there is a distinct line with how the two relate and influence one another.

Defining this relationship is crucial in order to understand the aspects of this thesis. The way environmental photography builds off of environmental science and vice-versa allows the back and forth of growth within these communities. As environmental science discovers new things and expands its knowledge, so does environmental photography right alongside of it. There are technical advancements that benefit the scientific world, but environmental photography grows just as much without these advances. While change allows for growth and benefits the field, older cameras have been able to capture impactful images just as powerful as newer ones. Technology
helps photography as cameras get better and better at capturing events, but the field of environmental photography grows every time it is able to capture something new regardless of the device. Of course, quality helps, but it seems that the more advances environmental science makes, the aspect of photography progresses right with it even without new advances in camera technology. It is pivotal to mention that photography has the ability to make people perceive issues in different ways. The way an issue is portrayed depends on how the subject is captured and communicated.

Along with explaining the relationship of environmental science and environmental photography, this thesis will specifically explore how photography is able to effectively communicate these problems to the public. Issues have to be framed clearly so that there is minimal room for misinterpretation of the information being presented. Photographs are able to spread awareness depending on the way the subject is captured and shown. The aesthetics of photography have a unique way of raising awareness to a given subject. Going hand in hand with that visual appeal, we have to question whether or not this awareness can actually create progress and change in our society. Has environmental photography helped raise public consciousness about climate change? There is a fine line between capturing a problem to emphasize that society must address this dire, existentialist issue, and aestheticizing that same issue with no social responsibility in mind. However, the aestheticization of certain aspects of climate change is one of the biggest reasons people pay attention. It is a bittersweet aspect of photography. The aesthetics of climate change photography aim to work towards social education. It can present as a challenge because of how easily the problems do not appear as a direct issue. It goes back to the root of the idea that climate
change is a faraway problem, one which people often feel disconnected from in everyday life. To portray something that is harmful and dangerous as beautiful can help educate the public, but also has a chance of backfiring and painting such a scary thing in a wonderful light. Here is where context of the pictures and setup of specific photos begin to help reduce the risk of negative portrayal. This all begins with how environmental science as a field has grown and begun to be truly acknowledged.
CHAPTER ONE

A TIMELINE OF ENVIRONMENTAL SCIENCE

The field of environmental science began emerging clearly in the 1960s as an acknowledged sector of the scientific world. There was a mass awakening as people witnessed chemicals being misted from planes, smog suffocating cities, and animals dying in unprecedented numbers from unknown sources (Cunningham & Saigo, 2005). In 1962, Rachel Carson released *Silent Spring* in order to open more people’s eyes to the dangers of harmful chemicals and pesticides. DDT was being dropped from planes to keep insects off crops and when Carson witnessed the clear adverse effects, she knew she couldn’t remain silent about it (Kroll, 2001). While it was only apparent that wildlife was being negatively affected, there was recognition that if animals were being poisoned from DDT, what was stopping humans from also being affected in that way (Dunn, 2012)? It raised awareness greatly and in turn, people demanded action. Around the world, there were numerous smog crises, most notably in London, where in 1962 smog laden with high amounts of toxic chemicals choked the air (Marsh, 1963). This air pollution led to disease and illnesses that measurably raised mortality. At this point, people realized concerted changes needed to happen. Fourteen years prior, in 1948, there was an awful smog in Pittsburgh that took the lives of 20 people as well as left 7,000 people with respiratory problems. The Donora smog that plagued Pittsburgh’s skies was due to industrial air pollution, however there were no immediate changes enacted afterwards. Combined with Carson’s call to action, these smog events made the public notice it was time to take air pollution seriously (Jacobs, *et al.* 2018). At this
In 1963, the United States passed the Clean Air Act in order to control air pollution. It has become one of the most influential environmental laws and continues to be amended. This was a turning point for environmental scientists because as more data was found, the public became more supportive of taking action. This law raised public awareness as communities had more data available to them and began supporting the actions being taken to reduce pollution (Melnick, 2010). The Clean Air Act was the first legislation that specifically gave attention to air pollution control on a national level. It allowed for research into methods that could keep track of and control air pollution, to create the very first stationary emission standards. However, the title is somewhat misleading because the act itself only “offered federal research, urged the development of state control agencies, and involved the federal government in inter-state pollution issues” but did not enforce standards (USLegal). It was soon recognized that standards needed to be actually applicable and realistic for the public. Due to this, certain amendments were made in 1965 that made it mandatory for the Department of Health to enforce auto emission standards. These added changes continued to be steps in the right direction.

1970 was a huge year for the field of environmental science. The 1970 Clean Air Act was a turning point in which the federal government was given real power to reduce air pollution instead of leaving it to the states (Rogers, 1990). The first ever Earth Day was celebrated in 1970, a celebration that continues to be recognized in current times. Arguably more of the aesthetic side of environmental science, Earth Day had more of an
impact than people thought it would. The success of the first Earth Day was bigger and better than anticipated (Rome, 2020). It was recognized as a national holiday and brought a new awareness to the harm humans were causing the planet. It soon became global and connected different parts of the world to help our Earth. Soon after the first Earth Day, the Environmental Protection Agency was established by executive order to regulate and enforce national pollution legislation (Freedman, 2017). This new cabinet-level agency was an impactful move towards healing our planet. After the EPA was established, the public began focusing on issues other areas of pollution beyond just air quality.

Wildlife became a spotlighted focus of many people and many organizations. Wildlife survival was a big indicator of how high environmental pollution had become. Changing animal populations all over were strong signals about the health of the environment (Czech and Krausman, 2001). With more push from the public, the Endangered Species Act was passed in 1973, crucially benefitting the world of wildlife. It was put in place in order to protect species at risk of going extinct in part by keeping lists of endangered or threatened wildlife populations. It is not only an American Act; it also contains international efforts as well (U.S. Fish & Wildlife Service). Overall, the act serves as a way to “conserve and protect endangered and threatened species and their habitats” (U.S. Fish & Wildlife Service). Certain emblematic species drove the act forward because of how drastically their endangerment was noticed. President Nixon became aware of the loss of bald eagle nesting pairs in America through studies that had “estimated that there were once 100,000 nesting pairs” in 1782, which by 1963 had dropped to 487 pairs (Popken, 2019). Because the bald eagle is our symbol in America,
keeping their populations thriving had great political overtones, making it virtually unpatriotic to suggest that we did not care about them. Implementing protection over bald eagles spurred saving other endangered species, resurrecting their populations as well. Once a population recovers, they are removed from the act. In 2007, bald eagles were removed from the Endangered Species Act because by then there were somewhere near 10,000 nesting pairs (American Eagle Foundation). This vast increase is clear evidence on how the efforts of conservation can impact a species. Other conservation efforts also became big during this time, including campaigns from the World Wildlife Fund (WWF), which had been established in Switzerland in 1961. Years after the Endangered Species Act was passed, recycling was also taking on a new popularity. The environment is deeply affected by plastic pollution however, we did not realize how negatively it hurt the Earth right away. Recycling became a newfound way to reduce the way plastic was affecting our environmental quality. It didn’t gain as much attention as other federal policies because it was state regulated, but Woodbury, NJ became a forefront leader as they “adopted a curbside pickup program” in 1980 (NPR, 2019). This new practice was critical at the time to influence other places in creating a change.

A few more amendments were made to the Endangered Species Act, but the next major warning that catalyzed the environmental science field was the discovery of the Antarctic Ozone Hole in 1985 (Yongyun, 2020). Joe Farman, Brian Gardiner, and Jonathan Shanklin had noticed large decreases in stratospheric ozone levels over certain Antarctic stations even though prior years had shown steady levels. Their data suggested that chlorofluorocarbons could be at fault and their “findings transformed the fields of atmospheric science… leading to global changes in environmental policy”
Understanding the science behind the ozone hole became extremely important because it was clear that there was an anthropogenic cause on a vast, fully planetary scale. The hole first appeared because these, “conditions unique to [the] region increase the effectiveness of ozone destruction by reactive halogen gases” (NOAA, 2010). There was always a relative awareness that humans were having a negative impact on the planet, however it was this discovery that really showed scientists some of the truly existential effects. This discovery made it harder to see a future where we healed our planet. This was because we had yet to see such a chemical impact that came from us (Yongyun, 2020). It encouraged and demanded that the issue be placed front and center, but we were now crossing into new uncharted territory. The damage we did seemed severe enough that we couldn’t recover, however it didn’t stop environmental scientists from pushing for more policies and changing the way humans were using the planet (Solomon, 2010). This passionate response from scientists created new ideas in the way of technology, specifically in technologies the public was using on a daily basis.

Cars were always an impact on the environment due to their contribution to air pollution, however in 1997 the concept of hybrid cars was gaining a ton of attention. Vehicles produce significant amounts of nitrogen oxides, carbon monoxide, and hydrocarbons on a regular basis. It is important to acknowledge that in the 1970s, adverse health effects from lead in gasoline were discovered and therefore lead was removed from gas (Needleman, 2000). In 1996, the use of lead in fuels was completely banned. These models that were hitting the market, “emit[ted] about half as much carbon-dioxide as gasoline powered vehicles” which in comparison was huge (Edelstein,
2015). Finally, multiple areas of our society were coming together to create solutions, communities all over wanted to make an impact. Hybrid cars have become more readily available; however, they can be more expensive for the average consumer. Technological advancements in different fields have supported new solutions to climate change related issues, the creation of electric cars being a viable solution to the damaging effects of gas driven automobiles (Lave, et al., 1995). However, as we progressed technologically, we continued to discover new effects of our actions.

The effect of climate change comes in many forms, but in 2015 we discovered yet another horribly negative effect of human’s consumption: The Great Pacific Garbage Patch, which was fully mapped and assessed to have 87,000 tons of garbage within it (Kostigen and Magazine, 2008). Even more sadly, it “contains more than 1.8 trillion pieces of plastic,” a pollution which is known for having extremely dangerous effects on oceanic life (Akpan, 2018). A lot of the ocean remains unexplored, so as far as we know, this trash could be impacting other parts of the ocean. As an extremely detrimental effect of human waste on the ocean, it has led to a lot of researchers studying specific pieces of garbage found in order to decipher exactly where they come from (Akpan, 2018). 30 ships crossed the patch in 2015 in order to get somewhat of an idea of just how large it was, their shocking findings pushing people to start making some changes. Soon, efforts towards reducing one-use plastic became extremely popular. Within a year, one of the most important pieces of environmental international legislation was proposed, the Paris Agreement.

The Paris Agreement was not just monumental in the field of environmental science, but also had a major impact worldwide for every field really. In 2016, The
Paris Agreement entered into force aiming to reduce global greenhouse gas emissions (Savaresi, 2016). This agreement was a huge step in improving the global environment as countries agreed to make efforts towards limiting global temperature rise. One of the great parts of this agreement was that it “provide[ed] a durable framework [in order to guide] the global effort for decades to come” (United Nations). It factored in future generations so that there was a clear plan for nations to follow. Currently there are 189 countries that have joined the agreement, the United States originally being one of them. In 2017, then-President Trump pulled the United States from The Paris Agreement in a decision that would leave the, “US greenhouse gas emissions at least 3% higher in 2030 than with the policies still in place,” pushing the United States into a harder position to get out of in terms of reducing its emissions (Climate Action Tracker, 2019). This decision struck a lot of people as a bad move and made a lot of climate scientists angry, especially as more information on how bad climate change was continuing to be released.

Alongside reports of climate change were photographs of some of the impacts. Photography began to play a huge role in depicting the issue in order to raise public concern. These still moments of our impacts brought a new awareness that pulled a need for action, as photos can do (Subhani, 2015). Comparative images of areas marking changes in pollution, termed before and after photography, became very useful in order to show the public just how much of an effect climate change was having on certain areas around the world. The public did not have the same opportunity that scientists had to witness climate change through detailed data gathering and analysis, so seeing photographs of the impacts gave the public its own direct look into the damage (Bubela, et
al., 2009). Witnessing this was extremely powerful when it came to the reducing one-use plastic movement due to some of the painful direct effects on marine life. A lot of people’s eyes were opened because of images of marine life stuck in plastic or being harmed by plastic. It played towards the emotional side of people and showed them how their actions that seemingly have no impact actually do harm marine life.
CHAPTER TWO

THE IMPACT OF ENVIRONMENTAL PHOTOGRAPHY

Communication is the key to educating the public and bringing awareness that will enact change. Science communication is vital in order to teach those who don’t have the same level of exposure exactly what the scientists are learning (Burns, O’Connor, & Stocklmayer, 2003). This can be a complicated process however because there has to be a necessary gap between what the scientists truly research versus what the public ends up seeing. There are multiple ways information can be transmitted such as graphs, data tables, photos, essays, and more though the public oftentimes does not know how to digest the science being presented to them (Miller, 2001). This is important to take into consideration when attempting to educate the public.

In the past there have been challenges that have come to light when scientists have communicated to the public (Rennie & Stocklmayer, 2003). As with most things, convenience seems to take priority when it comes to understanding something. It is far easier for research to be communicated to the public in a visual manner with statements referencing the data rather than having the public read the data directly (Hunter, 2016). Historically though, the public has a lack of trust towards scientists, this lack of trust has continued even in today’s times (Slater, Huxter, & Bresticker, 2019). Establishing a moral trust with the public becomes vital to communicating these urgent issues (Kappel & Holmen, 2019). Using tools such as emotional reasoning and visual connection expand this trust as they support the data being presented. Environmental communication is a touchy subject and has to be communicated in a way that doesn’t
frighten away those learning about it (Manzo, 2010). There are those that believe visual representation is the way to do just that.

Public perception is obviously extremely important for creating awareness and recognizing the role of visual information could prove to be highly useful. The method of visual images in educating the public is how people being to be engaged, there is more than what meets the eye when these images are presented (Wang, Corner, et al., 2018). As stated before, climate change is a delicate subject that has to be approached methodically and logically. Throwing the data the scientists spend years researching and all their figures, graphs, and tables at an average person is likely to be overwhelming and more than likely push the public away (Moser, 2010). Photography and the usage of visuals regarding the results of our impacts as well as any research found gives an aisle directly into the minds of the public to recruit more change and benefit our future.

To consider the role of photography in raising public awareness of environmental issues, we need to distinguish between landscape photography in general and the sub-genre of environmental photography, for the latter aims specifically to make evident to the general public issues that are not witnessed in everyday life, and also, to study the environmental changes in landscapes over time (Newhall, 1982). Environmental photography spans a variety of areas, including before and after photography, pollution photography, endangered species photography, and more. Before and after photography is often what one thinks of when they hear about photography which captures the impact of climate change (Kull, 2005). This is when a specific area is photographed at one time and then again at a laterpoint, showing the
changes that have taken place either as a direct effect of humans or simply by its own nature. Pollution photography is exactly what it sounds like -- a subfield which focuses on depicting pollution in the environment. Some of these images are hard to distinguish as pollution because of how aesthetically pleasing these pictures can come across (Tudor and Williams, 2003). Endangered species photography is the focus of a lot of wildlife photographers, they make it their goal to photograph species with dwindling populations in order to raise awareness (Mittermeier, 2005). These categories are only a few examples of environmental photography and the way photographers can influence environmental science. How can photography actually make an impact?

Repeat photography (or before and after) is a valuable aspect of environmental photography and can be done over a few years or over a longer period. It entails taking photos of a certain area from the exact spot over time (Kull, 2005). This allows the clear changes that have fallen upon the landscape to be captured. It’s difficult to remember exactly what an area looked like in the 30’s while you’re staring at it in the present. For all one knows, it has always looked the same. Most likely, this is not the case. In the 1930’s a set of panoramic photos were taken from fire lookouts in Glacier National Park in Montana. In the late 90’s new pictures were taken in the exact same location. It was clear from the new pictures that there had been pronounced changes such as glacial recession, forest recession, etc (Butler R. David & DeChano M. Lisa. 2001). The recession of the glaciers is readily apparent in the newer photographs. The photographs allow for scientists and park rangers to measure the recession, seeing just how much the glaciers are retreating over the years. This places more pressure on the fact that climate change needs to be taken seriously (Byers, 2007). These photos can be
passed around all over the United States, even the world, to show people the differences.

Through technological adaptations, scientists can use cameras attached to other devices to observe species in their natural interactions. By using a simple digital camera attached to a drone, scientists can now, “monitor the impact of beavers upon the environment” after their reintroduction to England (Puttock, A.K., Cunliffe, A.M., Et Al. 2015). This research is crucial for scientists studying species interaction and how reintroducing a species to an environment can go. In this case, wildlife specialists had an opportunity to look at how beavers have impacted the environment, which in turn assists the environmental field as a whole. These photos were a big deciding factor in whether or not Eurasian beavers should actually be reintroduced into more parts of England. Taking photos allows less disturbance of the environment and also a documentary record (Cheng, 2015).

Another habitat that has highly benefited from environmental photography is the ocean. Cameras that have been dropped into the deep sea have given marine biologists and scientists’ new eyes into this previously unvisited terrain. This newer technology has provided evidence of more deep sea oceanic biological processes that we thought were occurring (Paul, A., Thorndike, E., Sullivan, L. et al. 1978). Through environmental photography of the deep sea, we have seen new biological processes and species that we hadn’t officially found. The impacts that this kind of photography can have is monumental (Harvey, 1939).

There are photographs of environmental events that people automatically imagine when they hear the term environmental photography. An image is raised in their
mind, one that connects directly to environmental photography for a possibility of reasons (Danson, 2020). Whether it be an emotional connection, a strong memory from when they first saw the picture, or just an important event they remember hearing about and seeing in the news, it's ingrained in their heads. This calling to mind alone shows how much of an impact these images can have because they stick in people’s minds. To conjure an image in one’s head simply from hearing a word that reminds one of it is a clear testament to the power of photography (Sharot, Delgado, and Phelps, 2004). Whether it be the *Earthrise* photograph, photos of California wildfires, or pictures of the BP Horizon oil spill, there is value in public awareness (Figures A, B, and C). Without showing the world these photographs, people would not get to see the repercussions of our unconscious actions or just how much our planet has changed. Environmental photography gives physical evidence of thereasons we need to make a change. For example, a program raising awareness for a specific cause is far more powerful and effective when there are photos documenting its subjects (Seelig, 2015). Witnessing the burning wildfires in Australia through
photographs shows people the horror that others are experiencing, creating an empathetic connection.

Photography can serve environmental science in numerous ways, and there are two predominant examples. The first is the documentation of issues surrounding the scientific field (Ray, 1999). This includes images of species thought to be extinct, up close frames of viruses, and changes in environments. It is important to consider the other manner in which photography serves environmental science: emotional charge. When a photographer manages to capture an image such as the ones that are often caught during events such as wildfires, deeper emotions are evoked from members of the public who may not be directly experiencing the event (Hanisch, Johnston, & Longnecker, 2019).

Deforestation leads to loss of habitat for species often forcing humans to have to interject and rehome wild species. Images have been caught of animals in areas that have been deforested, appearing confused and alone. These images have been used to defend reduction of deforestation as well as appeal to the public’s emotions (Figure D). One sees this wild animal sitting alone where its home would have been, and they cannot help but feel a sense of guilt and sadness. Therein lies a selfishness of us humans that we do not notice until we are shown the effect (Gardiner, 2011). The more people who wish to raise awareness towards an issue such as deforestation, the more likely that efforts are made to help the damage. New methods have to be thought about and considered as ideas are
proposed, further expanding and helping to grow the field of environmental science. This ability to elicit emotion is one of the key features that photography can do that science doesn’t (Gorini, A., et al., 2010). It is a valuable tool which allows for examples that explain why it is so important to find multiple ways to communicate important things.
CHAPTER THREE

THE RELATIONSHIP BETWEEN ENVIRONMENTAL SCIENCE AND PHOTOGRAPHY

The link between environmental photography and environmental science is one which runs deep and holds high importance. However, photography and science have been interconnected for quite a while. In fact, Louis Daguerre saw the potential of his creation, the Daguerreotype, and began filing for patents in 1839 (Barger, M. & White, W., 2000). How can a category of photography help further a scientific field? Photography has allowed scientists to prove the existence of things from neutrons to viruses to species we thought were lost forever (Wilder, 2009). As photography came about with the rise of technology and began producing incredible works of art, scientists began experimenting with these new devices. The discoveries of visibly capturing DNA, viruses, and more were huge; they changed the face of science as it was known. The truth is that photography and science as a whole have always had a symbiotic relationship (McGovern, 2000). Photography obviously helped quite a bit in the medical sciences as well as genetics, but it created new pathways for environmental science as well.

The ways photography has helped environmental science are vast. In certain circumstances, the use of photography has allowed scientists to monitor specific features of species in order to figure out if there have been any changes. Via repeat photography, Crimmins and Crimmins were able to observe plant phenology as it is one indicator of global change (Crimmins and Crimmins, 2008). Repeat photography gave them the opportunity to capture these changes in a way that wasn’t labor intensive. All
that was required was for them to set a camera up to take photos at a certain point consistently. Allowing for quicker observation in real time, repeat photography can also be more cost effective (Brown, Ogutu, and Dash, 2020). This type of observing can be adapted by other scientists to monitor their studies as well. Hand in hand with that is the concept of camera traps: set up to give scientists the opportunity to study species remotely. Camera traps take a photo automatically when triggered by a change in activity nearby. Oftentimes they are attached to trees and equipped with motion sensors (Figure E). These types of cameras give us an inside look into the dynamics of a population as well as the behavior without direct human interference (Kays et al, 2009). Camera traps were an incredible invention in the world of environmental science because they detect animal species and can also capture the habits of insects and the functions of plants. There are other methods that also allow us to see the rare side of wildlife. There have been many occasions where an average person happens to capture a rare species on camera or even a species believed to be extinct (Kelsey, 2015). These photos give scientists evidence of a species still alive during this time. It also shows scientists the kind of habitats these rare or mistakenly thought extinct species are living in. These details can help scientists create possible hypotheses about why the organisms are so elusive or why their numbers may be dwindling (Witmer, 2005). Examples of this can include an increase in active predators, pollution increase, and an increase in food competition.

Figure E - Coyote carrying fawn, captured by motion sensor camera trap, Marine Wildlife Picture Index Project
An exciting discovery in the backyard of a North Carolina resident taught scientists that a species believed to be rare in the United States was actually residing quite comfortably. Sharing a love of wildlife in his family, this man decided to set up a camera to take videos of local wildlife so that he could upload them to his YouTube channel. It was completely unexpected that he would capture a video of such an elusive animal. The camera captured the black coyote rubbing itself on the ground, possibly trying to leave its scent (Johns Creek, 2020). From there the family posted the video online where viewers brought it to their attention just how rare this canine was. Wildlife enthusiasts were thrilled to see such an incredible species and its behavior in such detail. These opportunities to document species come from the technological advancements of cameras (Brown, J., & Gerht, S., 2009). During the pandemic, reduction in human activity has given rise to endangered species such as the pink dolphin in Hong Kong (Marcotte, Hung, and Caquard, 2015). Many people have been able to capture images of the beautiful species though populations were thought to be nearly extinct. Though these documentations are captured by chance, other communications of environmental problems through photography have to be portrayed with specific intent (Ohara, Yamanaka, & Trencher, 2019). In order to convey a particular message with photographs, it becomes necessary to place the subject in purposeful ways (Soussloff, 2006). The intent of the photographer has to be secure because the layout of a photograph is crucial in communicating the subject.
CHAPTER FOUR

HOW PHOTOGRAPHY SOCIALLY COMMUNICATES AN ISSUE

For as long as photography has been around, it has been used as a propagandistic tool in many different ways, because people tend to believe what they see evident in pictures. (Edom, 1947). Extreme kinds of editing that our current technologies allow us are only recent developments. During wars, photography was often used to control what the audience was seeing in order to communicate only a specific perspective (Collins, 2016). The death covering the land wasn’t seen by the average person, so photographers began to take advantage of this. Knowing that the visual of the carnage could prove as a tool to strengthen our patriotism and prove our strength, it became important to provide these images to the public (Figure F). The aesthetics of how photographs communicate is paramount, so this chapter will discuss how photography actually communicates each issue, in this context focusing on the specific needs essential to imparting the urgency of addressing climate change (Berger, 1989).

How can such an ominous concept be portrayed in photographs without terrifying their audience? It’s all about how the photographer chooses to capture their subject. Climate change is a delicate issue to capture because of how easily it can come off as scary -- which can sometimes overwhelm people and may make them want to

Figure F - Confederate dead behind stone wall by Mathew Brady, National Archives Identifier
disengage from the topic (Nisbet, 2009). At times, though, that is exactly how a photographer might want to depict it.

Certain characteristics make a photograph complete. There are guidelines that help determine the effectiveness of the photograph in capturing its goal (Mankikar & Phatak, 2014). The composition of a photograph, which is how the elements of a picture are purposefully arranged, determines what focus is being presented, and therefore where the viewer’s eye first goes. Composition generally follows five rules, the most basic being the rule of thirds. This is believed to be one of the most important rules as well because it provides an aesthetically pleasing picture (Amirshahi, Hayn Leichsenring, et al., 2014). The rule of thirds follows the idea that the subject of a picture should be placed along, near, or on one of the along lines that break up a camera view into thirds (Figure G). One might assume that the focus of a picture should fall directly in the center, but this doesn’t always create the best portrayal of a topic. The eye of a viewer naturally goes to where the intersections of the lines fall, which is why following this rule creates some of the best works. This also goes hand in hand with the balance between the amount of negative space and subject size (Maher, 2020). For example, if you want to capture just how large terrain is, yet still have a subject be the prioritized focus, it’s possible.
to do by following the rule of thirds, as shown in Figure H. This rule is what allows such an aesthetic result in pictures. Personally, this rule is one that has stuck with me since I was a beginner photographer. However, there are some other concepts that I consider just as useful when trying to capture the perfect image.

One rule that benefits a photographer’s work is reducing clutter in an image. When there are a lot of irrelevant background items it can create a messy look (Elkins, 2011). To explain it easily, it's distracting to the audience. The viewer’s eye cannot figure out where to look because there is so much occurring. Distractions in photography can occur often if a photographer isn’t aware of what is going on around them. Similarly, if there is too much negative space (the area surrounding the subject) it also diverts the eye from the focus (Maher, 2020). When there is a primary focus of photographs or a specific issue being communicated, that is what you want the audience’s main center of attention to be. There are exceptions to this because the best pictures don’t need the subject exactly in the center yet still have a solid balance of negative space and placement.

Placement of subjects has to be intentional in order to convey a message. It is the job of the photographer to anticipate where a viewer's eye will track along in a photograph (Lightstone, 2006). Where the eye follows is a secondary way to get a story across to a viewer. The first way being the immediate vision that is taking place in the picture, but as the viewer continues to study a picture, they should be able to point out little details which illuminate a message (Ahmad, Ohsawa, & Nishihara, 2011). This message could be the same as the one that comes from the immediate reaction, or it could be a deeper concept. Looking at figure I, the initial impression is that this photo is depicting some kind of move for the people in it. The people appear
to not be residing in the US and seem to be carrying a lot of belongings. A viewer might continue to study this picture, their eye begins at the center of the image trying to see what the woman is doing. The eye then tracks upwards to the large item she is carrying and as a viewer continues looking around, one can begin seeing younger children in the back also carrying items (Figure I). The feeling of the picture is one of urgency, facial expressions are of clear seriousness. A viewer can then infer that this is some kind of migration of this family. When context is paired with the picture, a viewer can understand that this is a refugee family having to hold every one of their belongings as they migrate to Thailand. This figure is also a great example of the emotion that can be captured in photography. The motion of the people and the seriousness on their faces leads to a sense of urgency that the audience can feel through the picture. The path that the eye follows is what influences the path the mind begins to follow (Peterson, Gillam, & Sedgwick, 2007). What I mean by this is that the eye’s path flows to the mind’s path. What you are seeing has to make you think in some manner or else the picture is not doing what it needs to.

These compositional factors of setup are critical, however there are other criteria that affect whether or not a photo is doing its job (Ni, Xu, et al., 2013). Color is a large factor towards how well a picture communicates. Bright colors capture an eye almost instantly and draw a viewer in, but darker colors can also do this in their own way. Brighter versus darker colors play off one another in magnificent ways (Eismann,
Duggan, & Grey, 2010). The contrast of them can create such an intense juxtaposition that sometimes a viewer may not even realize what they are looking at before finding context. Contrast describes the darkest and lightest parts of an image and helps to show texture (Zwick D. 1990). Balance comes back into play here as well. There has to be a middle ground to finding the right amount of contrast for a specific picture because contrast brings a certain element of emotion. There are types of photography that benefit from using high contrast, such as street photography and nature photography, whereas other types look better in a lower contrast (Zwick D. 1990). One of the uses of low contrast is conveying a dreamy state in a picture as shown in figure J. The colors blend together more which allows the image to have haziness. Oftentimes used in outdoor portraits to create a vintage-y appearance (Loewenberg, 1999). High contrast in nature photography is very popular, especially in capturing pollution. A fantastic example of a photographer who isolates this style is Edward Burtynsky. As shown in figure K, the brightness of the water in the photo of the Colorado River Delta stands out against the white landscape around it. It is an incredibly beautiful photo that is captured in such an intentional way that the viewer can not immediately tell what is being looked at. Yet, the addition of
context combines with the image to create a powerful message of the strength of nature (Becker, 1995).

All of these things factor towards making a picture ideal and give photography the power to socially communicate whatever issue is being captured (Zakia, 1993). Together with the intent of the photographer, the final product, and any additional writing, an audience can interpret the message. Visually, a picture should be able to convey a message independently from writing however context only serves to amplify implications of the work (Lobinger, 2016). This powerful ability though is nothing if this documentation cannot raise the consciousness of the public.
CHAPTER FIVE

CAN DOCUMENTATION RAISE CONSCIOUSNESS?

Can documentation actually raise consciousness -- that’s the ultimate question, isn’t it? Consciousness raising is a popular form of activism that is credited towards modern feminist movements (Sowards, K. Stacey & Renegar, R. Valerie 2004). The term is exactly what it sounds like: people bringing attention to an issue by focusing activities and advocacy on their specific movement. Documentation can raise consciousness by creating awareness, an example is a photographer creating a group of pictures to portray an issue (Figure L). In this series, Wara Bullôt created images through the process of dismantling photographs and then reconstructing new pictures from those piece. Bullôt was influenced by our changing world and the ongoing development of a constructed area, creating these images of a natural landscape and a modern area of construction convey how we’ve allowed our needs to overrun this planet (Bullôt, n.d.). No background information is necessary to create a story about what is being depicted. An audience can read a title and understand everything they need to (Titling, 2015).

Figure M gives another example of an image conveying the incredible nature of Earth,
yet in a more abstract way. The only context necessary here is the title to inform a viewer that this is a stone slab. The bright colors, abstract design, and close crop make it difficult to initially tell that this is stone. Through reading the title, an audience can gain an enhanced appreciation for the power the Earth has to create such beautiful forms (Reed, n.d.). Reed pursues abstract fine photography to teach viewers to have an appreciation for the natural world. His work is composed by the angles he shoots his subject at and often a tight crop. It eliminates the possibility of distraction by an irrelevant component in the frame. Communicating an issue in photography alone is one way to raise awareness, but it is possible that it is less effective than documentation with context.

Seeing a picture of a specific species might attract a viewer to be pulled into the work, but a picture of a species in a book of portraits of endangered animals sends a clear-cut message (Sartore, 2010). Sometimes the writing of the photographer is included to give background context, or the art can be paired with a writer’s work. Looking at Joel Sartore’s book RARE: 

Portraits of America’s Endangered Species, readers are taken aback by the beauty, yet also given important information about what they are seeing. Figure N depicts one of the many incredible pages found in this book, specifically the portrait of a vulture. What is not seen is the writing found alongside the portrait, a description of just how many of these birds are left in the wild, and what is being done to help keep their populations stable (Sartore, 2010). It is a vital
addition to have this writing so that once the beautiful image captures the reader, they are hooked and hope to find information about what they are seeing.

The purpose of this book is to raise awareness towards endangered species in North America. Sartore’s goal was to document these species in a new way, a method that would put an endangered kind of mole rat on the same level as an endangered elephant (Sartore, 2010). The size of each animal would no longer matter because Sartore began making the artistic decision to photograph each creature at eye contact level with absolutely no distractions in the frame. Aiming to create an awareness of all endangered animals, not just the cute fuzzy ones, Sartore pursued these studio-style portraits along with research on their dwindling population numbers (Jolly, 2017). This documentation was an opportunity to show people the kinds of diversity we were at risk of losing. The benefit towards this documentation is that the average person gets to see some exotic species which aren’t necessarily the ones first thought of when a person hears the term ‘endangered species’ (Metrick, A. & Weitzman, M. 1996). Sartore’s photographic expeditions raise consciousness regarding the importance of the loss of populations and trying to help endangered species. There is a personal connection between a viewer and a photograph, and even sometimes between the photographer as well (Novoslavska, 2016). Photographers recognize how crucial their work is to awaken the public to issues around them. Through working alongside media outlets and utilizing emerging technologies, photographers have been able to open the eyes of many to a changing world. Storytelling by photographers has become a common occurrence in order to capture the degradation of our planet and move the public to action (Seelig, M. 2015). The empathetic connection one feels when seeing, for example, a picture of a
baby animal from an endangered species paired with an uplifting caption is a large indicator that the public desires taking steps towards healing the planet (Shapiro, 2014). At our core, we are interconnected to this planet in such a way that we care for even the most different of species from us. It is worth acknowledging however that the documentation of certain topics can come across more beautiful than the subject being photographed.

Documentation via photography allows our consciousness to raise to a new level of awareness in modern times. An important note to make is that one of the things documentation does best is give our future selves a chance to recognize the changes we have made (Leonard, 2010).

Frankly, I believe the answer to the question regarding the ability of documentation to raise consciousness is a clear one. Yes, documentation has the power to raise consciousness. It has to because how else would discovery spread without some kind of evidence. Photography provides our world with the ability to document a visual and therefore give anyone and everyone the experience to see something firsthand.
CHAPTER SIX

THE AESTHETICIZATION OF POLLUTION

The focus of pollution is a primary one in the world of environmental science and climate change. It is a modern-day problem that we have slowly made progress towards reducing. Though some reduction has occurred, our planet remains polluted in many different regions (Inambao, 2018). Our air, our waterways, and our land are all considered polluted. Based on how many images of environmental photography are of pollution, it seems like a complete category of its own could be pollution photography (Davies, 2018). There is a fine line between capturing an image of pollution that brings awareness to the problem and one that aestheticizes the physical appearance of pollution.

Air pollution has long been an issue around the world -- smog has clogged our skies and led to plenty of negative health effects on humans (Kampa & Castanas, 2008). Documentation of the polluted skies has become a big piece of propaganda for environmental groups such as Greenpeace. Using the images of smog and polluted skies to support the research they have done to track the costs of air pollution has allowed a bigger following and support from other groups (Greenpeace, 2020). The way the sun sets and rises often illuminates our world in bright colors yet mixed in with air pollution creates a juxtaposition of beauty and danger. Figure O is an example of this parallel:

![Figure O - Polluted skies, NIH](image)
between gorgeous colors and harmful toxins. Right from first glance, the dangers in figure O are not necessarily apparent -- another example of how context plays an important role. This type of picture can aestheticize this effect in the air.

Looking at figures P and Q, it’s clear that this way of combining the horror of air pollution and the alluring beauty of the sky has become extremely popular. This kind of aestheticization is quite bittersweet (Magagnoli, 2016). On one hand, it highlights the beauty still available to us, yet on the other hand it hides the dangerous nature of the pollutants. We become so focused on adapting to the pollutants in front of us instead of solving the problem (Mayer, 1999). Imagine the same pictures as figures O, P and Q but without the smokestacks and the smog. It would simply be the magic and beauty of our natural planet. We have become desensitized to the pollution in front of our eyes. Air pollution is not the only kind of pollution that has become aestheticized, one of the biggest categories of pollution that appears to conceal its dangerous way is waterway pollution.

Pollution in bodies of water presents itself physically different than air pollutants. There is sometimes a vibrancy to it, it could almost be considered an eye-catching beauty (Figure R). This isn’t always the case, but when it is and it’s captured in photography, it’s hard to remember the toxicity it represents. The ocean is a well-known victim of
global warming and climate change; however, the average person does not get an up-close view of the harm done to it (Herr, 2009). Even in some pictures it doesn’t appear that way. The range of water pollution is drastic, but pictures have the ability to depict this variation.

Figure S appears like a well contained area of pollution in a body of water, yet the longer one looks at it, the sooner one realizes it’s shot from afar and it is actually a huge area. It also indicates that the toxicity spreads out farther than what can be seen in the frame.

It’s pretty challenging not to admit that these pictures of pollution have a stunning appearance to them. Artistically speaking, the colors and the composition of the pictures are breathtaking. The downside is the subject of the pictures is poisoning our natural world.

The other area of our planet that we have horribly polluted is a more obvious and less aesthetic one, the land. Our pollution comes in many forms in this case: litter, soil pollution, and more (World Health Organization, 1982). Pictures that capture land pollution often convey an obvious deterioration. Certain aspects, such as soil pollution, are much more challenging to capture because they can occur at microscopic levels (Sonzogni, W., Chesters, G., *Et al.* 1980). These challenges make it hard to capture the level of damage that this kind of pollution does to our Earth. Land pollution
photography does tackle these subjects, though, and helps to bring awareness to campaigns that want to reduce waste. There are specific areas all over the world that litterends up gathering and cannot decompose. Even items that are said to eventually decompose can take over ten years (Berg & Laskowski, 2005). The physical appearance of land pollution is different from other types of pollution (Figure T). As a result, photography of land pollution seems to move away from the habit of aestheticization.

This poses its own set of challenges because aestheticizing an issue is how the attention of the public is caught. The easiest way to describe it is that people often don’t want to simply look at a picture of a pile of trash (Tudor & Williams, 2003). However, some artists have begun attempting to create more interesting ways to capture land pollution, by choosing to focus on the communities more deeply impacted. It's important to combine the disgust of pollution and the eye-catching ability of photography to grasp the public’s attention. The health impacts alone of land pollution are not often paid attention to, let alone the effect that this kind of pollution can have on wildlife (Khan & Ghouri, 2011). Certain communities around the world are more impacted by waste and land pollution than others. Poorer countries tend to end up with the trash that other countries don’t want to deal with and get stuck with the downsides of having such strong land pollution (Moore, 2011). Akhlas Uddin wanted to bring awareness to the issue of land pollution in Bangladesh because of how accustomed the people have become to it.

Figure T - Municipal solid waste on a beach by Vladimir Melnik
Urban garbage has become a lifestyle where villagers will move closer to the polluted areas in order to collect materials to sell. It's dangerous, unhealthy, and extremely dirty, but for some people it's the only way a living can be made (Figure V). This perspective of land pollution goes back to the importance of having an empathetic connection with the audience. By capturing the harsh conditions that these villagers have to create their livelihood from, it draws in an audience of people who can see how their own waste has consequences they never anticipated. Aestheticizing pollution is a common occurrence in photography and yet a bittersweet one (Uddin, n.d.).

As humans we’ve become so attached to the physical appearance of everything, even the most harmful toxins that have damaged our planet. Creating beauty in images from these horrors is what gives documentation the power it has (Adler, 2015). The public begins to care when these pleasing images find their way into the news. Aesthetic creates change and photography captures aesthetics. The ability to capture these necessary topics to save our Earth gives support to the entire field of science (Neumann-Hinds, 2007). It’s nearly impossible to simplify it into words how drastically photography has and continues to provide help to environmental science specifically.
The impact of photography on our modern society is undeniable. Less acknowledged, yet still relevant is the effect on the field of environmental science by photography. There are still efforts made towards bringing awareness to how much of an impact photography has had on environmental science. These efforts from the past have helped grow the field and provide pathways for how future photographers can bring about change. The combination of the two fields work to make a difference in our world. There is a symbiotic connection that allows progress from one to further progression in the other.

Gathering a timeline on the pivotal moments in environmental science is relevant to the understanding of how photography began feeding into the field. The establishment of these points creates a sense of movement in the field’s history. One notion of this timeline is the fact that some of the oldest legislation topics (smog, clean water, endangered wildlife, etc.) has come to be some of the most focused on for photographers. These subjects still remain heavily impacted by climate change and are necessary to continue to be photographed and documented. As discussed in the last chapter, air pollution has become a highly photographed topic because of the aesthetically pleasing way it can come across in pictures. This is, in a way, ironic, because the Clean Air Act was one of the first pieces of environmental legislation passed. It is only because of recent developments in photography that we are able to capture the capacity of air pollution. One can only speculate that if current photographic technology had been accessible at the time of the Clean Air Act, we may have been able
to document and provide photographic evidence to support the act much sooner. This also may have increased the number of supporters in the public to an even higher extent. The magic of documentation is the capability of awakening the public.

Endangered species of wildlife are a worry for a lot of people that care about our planet, however there is not necessarily an opportunity on a regular basis for just anyone to see these species in person. As the knowledge of biodiversity grew and the importance was understood, it became crucial for foundations to try and gain support in order to help endangered species. The pictures taken of these creatures provided the average person with a way to connect to them. People could see these incredible wild animals in a new light, in a new way that made them want to donate money to research and protection of such species. Joel Sartore’s efforts to capture all kinds of endangered species so that anyone can feel the urgency of their life is the perfect example for how photography provides a connection. The conscious effort Sartore made in taking the portraits at eye level with the animal was an artistic decision that creates an intimate balance with the viewer. It comes back to our power as humans to step up and combat the damages we have caused.

Professional photographers are not the only ones who have a voice in the world of environmental science. Average people who install camera traps in their yard and manage to capture lesser studied species have made a significant impact. Through their work, researchers have discovered species bounding back from dwindling populations as well as locating certain species in areas never thought to inhabit them. This is an incredible benefit of the technology levels we have reached. Overall, though, it is not just the grasp of a moment in a picture that makes the impact photography does.
Documentation awakens consciousness in the public, it is as simple as that. The documentation of any issues is further supported with research by scientists. I would argue a solution to a problem is more powerful and likely to gain traction if there are images depicting the impacts. If we were somehow able to provide the public with a daily photograph of the effects of climate change on a certain area or species population over time, I believe they’d feel urged to help the problem they were seeing. Photography physically allows the public to see a large-scale issue up close on a personal level. We are innately selfish, therefore the photographs of climate change effects negatively impacting humans directly (such as our health, overpopulation, etc.) can gather more support to increase efforts. Humans are the leading cause behind climate change, and though we have made progress towards reducing our negative impact on the planet, smaller daily actions we take can add up to a bigger consequence.
PART TWO: A PHOTOGRAPHER’S RESPONSE

INTRODUCTION

Accepting our role in global warming and climate change is the first step in making progress towards an eco-friendly society. Often, the blame is not something we want to take on because climate change feels so distant. Climate change is often perceived as indirect and a future issue rather than one currently occurring. Since it is unlikely that the average person experiences a direct effect of climate change every single day, most of us cannot feel the urgency. When it presents itself in our daily lives, it can often be subtle changes that many people may not recognize. The exception being climate scientists and those of us in related fields, because we see the data and where it seems our planet is heading. Another factor that plays a large role in not wanting to accept the blame is the fact that most of the generations now dealing with these effects are not the leading cause behind how it came to be. This may be true, but it does not change the fact that we, and our future children, are the ones feeling the effects and the ones who need to find solutions.

When learning about the effects of climate change, there are big impacts that everybody thinks of: unusual climate patterns at certain times of the year, ocean acidification, ozone loss, glacier melting, increasing CO2 in the atmosphere, and rising sea levels. While these consequences are detrimental and extremely important, there are harmful habits that humans do on a regular basis that contribute to global warming as well. Change can be uncomfortable, yet the anthropogenic effects can be combated through making efforts in our daily habits. I chose to center my pictures for
my thesis around these lesser-known consequences of our actions. Bringing awareness to these habits will hopefully open other eyes to the smallest of things we do that end up having an adverse effect on our planet. Individual action will force necessary changes by large corporations and governments who have the power to mitigate climate change.

The first habit I chose to focus on was overconsumption of material goods. In our society, we often find ourselves becoming accustomed to objects and purchasing similar items over time that serve the same purpose. Whether it be makeup, tools, shoes, clothes, or phone cases, we all have our own niches that we give into. There comes a point, though, when it’s important to step back and see how this consumerism has begun to consume us. I have personal experience with overbuying clothing, then before I know it, I have four shirts that all look the same. It’s beyond common for people of any generation to conform to this habit however I have found that as the importance of fashion grows in our society, the younger generations begin giving in more to these comforts. Comfort is the trend of our habits; change is uncomfortable therefore we often aim to avoid anything that forces it in our daily rituals. The fact of the matter is that we do not need seven different blue sweaters just because they come in different shades of blue. They all serve the same purpose. Purpose should be what we prioritize so that our consumer footprint as a whole can be reduced.

Consumerism doesn’t only take place in the world of fashion and collecting items, it also finds its way into our fast-food habits. Fast food can make life easier, but it ends up contributing heavily to climate change. It increases fuel emissions, single-use plastic, and an abundance of waste. We find ourselves choosing the cheaper, faster
option over the one that might take slightly more time. People have become attached to their drive-thru coffee order in the mornings instead of buying coffee to make at home. It doesn’t matter that the plastic cups add up or that the price become astronomical, even if it isn’t noticeable from one drink. It is a costly habit, and it ends up in the wildlife of our planet. Whether it be the ocean or forests, single-use plastic has a huge consequence on our planet. Wildlife is affected directly by ingesting it as well as getting caught in it. However, the earth itself is affected because it doesn’t decompose in a healthy manner. Plastic also disrupts the flow of the environment because it can transport certain microbes as it moves. With the combination of how messy the average teen tends to be and how often they consume a fast-food beverage, the amount of single-use plastic accumulates around them.

Arm in arm with that habit is simply the gathering of waste from an average person. I am positive you’ve seen trash along the side of a highway or possibly on a forest path. Litter finds its way, so it seems, to every nook and cranny of our planet. We produce an enormous amount of waste due to essentially all products we use coming in some kind of wrapper. Trash is often discarded anywhere that is convenient by those who don’t care about the environment — another habit that stems from comfort and convenience. Even the most pristine places have most likely dealt with cleaning up litter at some point. Often, there are parks and beaches that have to regularly clean the areas to maintain a clean environment because of how often trash ends up there. Beaches are a huge place for buildups of litter and over time this trash becomes buried beneath the sand and leaches into the ocean. It’s dangerous and damaging to all parties involved. Trash waste is probably the most common kind of waste we poison our planet with, but
alas it is not our only one. Food waste has become a huge problem in our society.

Without even realizing, we often discard perfectly edible food simply by the way it looks. We assume a brown spot on a piece of lettuce means it is no good. This leads to an over-accumulation of wasted food; food that could’ve fed numerous people. Expiration dates also come into play here because as a society we have been taught that once the date on a container has passed it is inedible. Food doesn’t work in that manner, generally anything can still be eaten weeks after its assigned date. We are not taught these things, but instead taught that the imperfections in our food make them ready for the trash. Grocery stores, on a larger scale, are responsible for a lot of food waste, but individually we can make a huge change if we stand up for reduction of this kind of waste. If more people were educated on food, grocery chains, and expiration dates, the amount of edible food thrown out would most likely be reduced to a much smaller amount. Once uncovered food is thrown away, it becomes unusable to anyone else because of the possibility of contamination. The brighter side to food waste is that there are people using it to make a difference; dumpster diving for food to try and reduce their own waste. Companies have also created ways of giving wasted food to those in need if it has not been used or tainted. This is a powerful way to combat food waste production as it becomes more and more common to disregard perfectly fine food.

In these different times, a lot of people have found themselves relying on online ordering for even the most basic of needs. These online orders can come from air transportation as well as car/truck transportation. Air travel is a heavy polluter of our skies, responsible for a lot of fuel emissions into the atmosphere. As we know, cars can produce emissions as well, especially a mail truck traveling large distances to
deliver their packages. Coronavirus has impacted online ordering, majorly increasing it as companies become more available online, however this option has always been around. Ordering things online, whether it be furniture or groceries, has always been an alternative to physically going to a store. The popularity spread as the pandemic began, rightfully so. As we move into a better understanding of this pandemic, we are still seeing heavy reliance on online ordering. Though understandable, this habit leads to large amounts of cardboard and plastic packing from the packages. Again, over time and for some even just in a week of purchases, there is a big add up of this waste. Some of these orders are necessary, yet some of the waste can be minimized if people did one order instead of multiple small ones. These habits (overconsumption, single-use plastic, littering, wasting food, and mass online ordering), though seemingly inconsequential, intertwine as the average person most likely does a few of each. All of them impact our footprint on this planet.

I wanted to use my abilities as a photographer to capture these patterns that the average person may overlook. It wasn’t until I spent a semester in Lydia Horne’s honors tutorial ‘Climate Change in our Daily Lives’ that I began acknowledging my own impact on the planet through these smaller practices. I had never recognized how these little habits could connect to climate change, let alone imagining the impact with everyone that is also participating in the same ones. This became a primary focus of mine while I was doing research for this thesis because of how unaware I realized people had become. I spoke with friends, roommates, and even family about their minor rituals that impact climate change. None of them had any idea there was correlation there. That was when I knew I wanted to capture my interpretation of these habits for
this project. Photography is how I communicate, so as I had this epiphany, I knew I had to create a series about this topic.
Overconsumption of goods is something I observe in everyone I know, including myself. I felt as though it needed to be photographed in a relatable, modern way. Shoes have become a forefront of fashion in today’s times, people are willing to spend hundreds on a single pair of shoes. Buying multiple pairs of expensive shoes is not unheard of either. Though all serving the same purpose and completely functional, it doesn’t seem to matter. For my pictures, I decided to use shoes that were similar in color as well as shape because. These pairs all look nearly identical, as seen in both figures, yet she has to have all of them.

Based on what I wanted the focus of my pictures to be, I didn’t want the photos to have any vibrant colors that could distract the eye. The only color I really needed in the pictures that mattered was the shoes. Since the ones we used were all white, I knew the shoe boxes needed to be colored in order to provide contrast. Contrast was also necessary to create with the model’s leggings so that the photo wasn’t too neutrally colored. I made the conscious decision to have my model posed in ways that appeared in plenty of shoe ads in order to convey a sense of similarity. Figure 1.1 was set up in a specific manner that forces the eye to be drawn to the shoe in the center first, that is the immediate focus. However, as a viewer continues to look and study the picture, the rest of the shoes become apparent. This isn’t a simple case of trying some shoes on, there is a clear continuous pattern. The habit of buying a similar item multiple times just because is a common occurrence. There is a comfortability, one I particularly wanted to
communicate with these photos. In both figures, though the primary focus of the model is the pair she is trying on, I intentionally left the second new pair of shoes visible to the viewer. I chose to include these along with multiple new boxes because even with one new pair of shoes, people are already thinking of the next.

When it came to figure 1.2, I hesitated to choose the one I did because the rest of the model’s body was not included. As I studied the photo longer, I realized it was perfect for the message I was trying to convey. By leaving the rest of the body out, the shoes really did become the primary focus. This eliminated distractions and negative space from the picture. I also wanted to shoot a picture from the perspective of trying the new shoes on, this is where people tend to draw the excitement from. There is a rush of newness that comes with
consuming goods, this rush being one of the reasons people become so accustomed with buying.

Choosing this specific habit of people came from a regular conversation with my friend discussing what we did over the weekend when she told me she bought four of the same shirts all in different colors. I was surprised because though I’ve had my fair share of spending money pointlessly, I had never done that. I started researching consumption of goods along with fast fashion. I had remembered learning about the consequences of fast fashion in Lydia Horne’s class, so paired with consumption the impact left me speechless. I also realized there was no way my friend was the only one participating in this. It came down to comfort, convenience, and complacency. How many people actually know that their consumption of goods through fashion sources has consequences on our planet? Most likely, not many. When I thought about the possibility that people were not even aware of their action’s effects, I knew I wanted to include over consumption in my photoset.

As overconsumption remains an occurrence in multiple areas of people’s lives, I found a subject I knew I needed to portray; the subject being single-use plastic. Everything nowadays has its own plastic seals and containers that are often not reusable, or people do not want to reuse them. Partially inspired by another friend, I knew coffee drinks were an easy route to go in order to capture this issue. I was in my friend’s car one day when she suggested getting coffee, so I agreed. After she finished hers while we were driving, she tossed it into her backseat. I must’ve been completely oblivious because when I looked back there, there seemed to be an enormous mountain of these cups. All with plastic straws inside. I was shocked and completely thrown off. Single
use plastic was the topic I covered in my final project for Lydia’s course, so I knew the harm to the environment that came from even just one of the cups. I began rambling off everything I could remember, all about marine life being harmed and the chemicals from the production of plastic. I was struck with the idea for a photoshoot as I rambled on.

Collecting the cups was no issue, I simply asked my friend if she could keep the cups in her car even longer and if she’d be willing to model. I wanted to illustrate the mountain I’d seen in her backseat, except this time in the front. Her car wasn’t the only car I’ve been in where I’ve witnessed this, it was just more accumulation than I had ever seen. My own habit of throwing trash on the floor of my car tends to happen in the front seat, so I knew there was a realistic aspect tohaving it be there. It became important to me to portray these habits in realistic ways, though all the images are posed, I did not want it to come off that way.

For figure 2.1, I became aware that the gear shift was visible in the pictures and immediately had the model move it to drive though we weren’t moving. This angle was slightly harder to capture because of the distance between the passenger side floor and where I was shooting from. I chose to angle figure 2.1 from the driver’s side because I wanted the visibility of the cups to be more discrete than figure 2.2. I also
wanted the current cup she was drinking from to be a large focus. The color of the
drink and the location (in the center of the picture) of the cup are where the eye first
lands, but as you follow upwards along the straw the magnitude of plastic in the car is
unmissable. The sunlight lands on the cup pile in such an illuminating way that though
your eye finds the brighter ones first, as it moves along the cups that are all the way in
the dark underneath the dash are visible.

Figure 2.2 provided a bit more of a
challenge to perfect the angle I wanted. I
made the decision to shoot from the
perspective of the cups because it would
help magnify just how big of a problem this
had become. As I took these pictures, I
made sure the cup she was drinking out of
and the cup in the cupholder were both
visible, yet not the main focus which was a
challenge. I needed to utilize the sunlight
coming through the window, so I made sure
it caught the cup she was drinking from just
enough to give some color, yet not distract the eye. The convenience aspect of picking up
a coffee also becomes pretty recognizable in figure 2.2 because the drive-thru stickers
on the bottom right corner are readable. This was a tiny detail that I felt extremely
necessary in order to convey why this habit has become so popular.
For the theme in these photos, I wanted to really emphasize the capacity at which people allow this habit to grow. When discussing single use plastic, people tend to say that their one straw in their cup won’t have any affect. The truth is it adds up. In a lot of cases, it ends up in unfortunate places as well. Though there are people who make efforts to recycle and not litter, there are plenty of people who don’t take those same actions. Litter is something we have become accustomed to — essentially, we’re desensitized to it because of how often we see it. It is simply a part of our everyday life. Beaches have become well known spots for litter to accumulate. People stop caring when they’re on vacation or having fun, they disregard any possible responsibilities, including picking up their own trash.

All kinds of trash end up on beaches whether from washing in from the ocean or being left behind. I couldn’t even tell you the number of times I have been on a beach and found numerous pieces of trash. Litter is harmful to wildlife, it’s not visibly attractive to look at, and most of it doesn’t biodegrade for a very long time. Inspired by the number of times I’ve gone out to pick up trash, I knew I needed to include this subject. I chose pictures of people picking up trash instead of leaving it behind because I wanted to capture just how much trash can end up on a beach.

Setting up these pictures required finding a lot of trash, making sure the models were wearing appropriate attire, and capturing the actual motions of cleaning up the beach. All I needed to do was lie down and take photos as my models found trash around Old Orchard Beach. In figure 3.1, I found there to be some irony behind the fact
that there was a coke can buried near a McDonalds fry holder because of how heavily consumed those products are in the U.S. The vivid colors created a wonderful contrast against the blue of the sky and the ocean. They also stood out quite brightly against the sand so even though this was a wider angled picture, the viewer’s eyes were drawn to distinct spots.

I used a similar idea for figure 3.2 because I felt that the angle captured how normally small the trash is physically compared to a person, yet in this shot it seems nearly comparable to the size of the models. Less of a bright color, the black still stands out against the surroundings. I chose to shoot this picture a little bit more closely angled than figure 3.1. All of the models in figure 3.1 are in the middle of picking up a piece of trash which is one of the reasons I selected it as the final shot. It was a moment where there was trash near

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**Figure 3.1 – Sandy disregard**

**Figure 3.2 – Sandy disregard**
each of them enough so that they all had their own pieces to put into the bags. The reason I liked the poses of the models in figure 3.1 was because they were all in a different stage of what happens when one picks up litter. As the viewers eye follows the picture, the left model is searching, the middle is mid pick up, and the right is putting a piece of trash into her bag. This created an extremely nice flow of movement because it followed the flow of events that the people were acting out. In both pictures, I made the decision to have an object in the foreground and the people less focused in the background. As I said, this was because I wanted to make the size of the trash comparable to the impact it has on the environment. However, this is not the only reason. I also made this decision because though the pictures are capturing a positive action of cleaning up a beach, I still wanted the primary focus to be the fact that there is trash on the beach. Litter has been around for as long as trash has been around. We continue to make efforts to clean locations and punish people that disregard the rules of not littering, yet trash makes its way wherever it wants to. It was for this reason, I wanted the literal focus of the picture to be on a piece of trash instead of the people cleaning it up.

Waste is a huge byproduct of humans. We manage to produce waste with everything we do. Yet, the blame isn’t entirely on us as individuals, but on society as a whole. Food waste is a huge contributor to environmental and social issues. A lot of poorer countries that suffer from our climate consequences also suffer from lack of food. We maintain habits of frequently wasting perfectly good food. This isn’t true for the entire population of the U.S., because there are those that implement changes when they learn about food waste. Generally speaking, however, we’ve been taught to toss
out any food that has a slight imperfection. This begins a cycle of waste in our kitchens.

Many don’t know that expiration dates are not throw away dates, there isn’t some magical change that occurs the second that day comes that contaminates the food it’s on. Previously, I was a huge waster when it came to food. If there was something that slightly looked off, into the trash it went. I was selfish and quite frankly naïve about food waste. As I researched food waste (yet again, for Lydia’s class) I felt disgusted at myself for completely discarding perfectly edible food. I couldn’t even remember where I got the notion that if a banana was slightly brown, it was no longer good. When I was brainstorming this thesis and this food wastephotoshoot, the phrase ‘edible trash’ wouldn’t leave my mind. We were throwing away all this completely usable and edible food that could help so many not be hungry. I was then struck with inspiration regarding what food I’d use. Lettuce and broccoli, the two foods I found myself most often throwing away.

Figure 4.1 depicts the conscious choice we make to throw a good amount of food away, whether we realize it is a waste or not. We are still choosing the piece of food that physically meets our expectations. That’s what one becomes comfortable with. Though the lettuce in the trash may not look as bright or tightly bunched together, it’s

Figure 4.1 – Edible trash
still completely edible and safe. I also wanted there to be few color distractions in this photo aside from the walls and the lettuce, I wanted the vegetables to be the only source of green. I decided this while taking pictures because I felt that there was something powerful about the only green being between the good enough food and the food not deemed good enough.

The closer up shot of figure 4.2 was another artistic choice I made because the focus needed to be on the vegetables.

Figure 4.1, as I described, was conveying the message regarding the decision to throw the food away. Therefore, I moved the focus from the decision towards the action that occurs after it had been made. It is no longer a thought in the person’s mind, they continue chopping vegetables as they want. Making sure the vegetables cooperated yet did not look too unrealistic was tough. I believe I achieved it, though. The brown on the broccoli and lettuce are completely visible, but the green is still so intensely vivid. This shows viewers just how completely edible the vegetables still are.

In both figures, the actual focus of the camera is on the vegetables in the trash, but this doesn’t take away from the trail that eye follows. The rest of the message still remains in the pictures. The focus is what also emphasizes the message. Without even
knowing these pictures are representing food waste in the average kitchen, there is an indication from the focus that the trashed vegetables are the priority. The rest of the message speaks for itself.

Food waste was an issue I’d realized I had been around my entire life. However, it was pretty stagnant throughout my life. Recently I observed other habits that seemed to increase as the pandemic progressed. Online ordering has become a convenient habit of many people. It’s a method so we don’t have to do anything but get up and go to the front door. However, some people have begun taking it to extremes. Ordering absolutely anything and everything they can from online sources such as Amazon.

The reliance on mass online ordering doesn’t only produce waste, but also contributions to fuel emissions and air pollution. In these photos, I wanted to capture the fact that often times people put in a bunch of orders separately, not even attempting to make it one big order. Had it been one order, waste would’ve been reduced. This isn’t something that a person is often considering though. There is disregard for the impact of online ordering. We become complacent in our habits simply because they are what work for us, even when they harm others.
In figure 5.1, I wanted to portray the abundance of packages people tend to order at once, simply because they can. I wanted this picture to have a sense of convenience and give off the capacity that people rely on online ordering. I chose this picture specifically because it has the action of the homeowner coming out to retrieve all his packages, but the primary focus wasn’t him. I didn’t want the distraction of the model to take away from the pile of packages in the corner. It may not be as initially obvious in this image what the focus is, but I liked the discrete nature of it. A viewer first looks and as they continue their eye finds the packages, but in connection with figure 5.2 there is a clear habit of ordering.

Figure 5.2 is the definition of what a delivery wasteland is. The model’s entire recycling bin filled to the brim with Amazon packages and he is putting in two more. I’ve seen this exact occurrence in my neighborhood, it’s not uncommon at all.
wanted to create a slight hyperbole with the boxes, but it seemed that no matter how
many boxes I added, it was always a realistic amount I’d seen people order. The colors
of all the packages also stand out in the photo because they surround the entire center of
the image. For this image, I aimed to capture the waste side of online ordering, less so
the abundance or reliance on it. With online ordering becoming the trend around the
pandemic currently, I made the choice to include this theme. I felt it was valid to include
because though reliance has increased, online ordering has been around for a long time
and there have always been people that mass purchase.

Our anthropogenic impact on the planet comes from many different angles, but I
knew that with the photoshoots I was doing I was focusing on local and individualized
actions that add up to major systemic problems. Choosing these habits was how I came
up with my ability to make a difference, because these are all patterns that a lot of
people don’t realize affect our environment. Educating people on their own impacts
towards climate change is hugely relevant because a higher percentage of the current
young generation is willing to listen. Changes can be made, and habits can be taught to
be avoided simply by showing people the consequences. These pictures create displays
of our negative habits instead of just having to tell people that some of the things they’re
doing are bad.

As reiterated throughout this thesis, photography creates a connection between
subject and viewer. It allows there to be an undeniable link. These photoshoots I chose
to capture highlight the close bonds the average person has to climate change and
impacting the environment. The documentation of these patterns combined with efforts
on how to combat the habits can help lead to immense change that can be brought about
on the local level. Individuals can recognize that they have a way to make a positive impact, since it’s often said that climate change feels like a distant problem. By depicting these habits and possible changes to make in our own lives, it might show people that mitigating climate change isn’t hopeless anymore.
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Sophia K. Wilcox was born in Annapolis, Maryland on April 7th, 1999. She started college studying wildlife ecology at the University of Maine in Orono in the fall of 2017, switching into ecology and environmental sciences in 2018. Remaining in the Honors College program her entire college career, she has pursued the Bachelor of Science program offered by the Department of Natural Sciences, Forestry, and Agriculture with a concentration in Ecosystem Ecology. Upon graduating, Sophia intends to travel the U.S. pursuing wildlife photography before applying to graduate schools for a M.S. in wildlife studies.