

# VISIONS

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# About Visions

**VISIONS MAGAZINE** is dedicated to the world we live in and the world we hope to create. *Visions* is a non-partisan, peer-reviewed publication that contains articles from disciplines associated with environmental studies. Just a few of these disciplines include communications, political science, economics, philosophy, religion, art, and English. *Visions* is a faculty-student organized and operated publication that features the works of Elon University students and student-faculty collaborations. The ultimate goal of *Visions* is to allow students to explore scholarly research, writing, and review in a professional setting. In addition, *Visions* provides publishing opportunities for students with interests in the environment and sustainable development.

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*Visions* seeks compelling, interesting, well-written, creative contributions on environmentally related topics. Major contributions to *Visions* should be grounded in scholarly literature and/or reflect the conventions of research and writing associated with a specific academic field of study. All submissions must receive positive blind peer reviews before consideration for publication.

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# shadowing my father's 60 years

By Alissa Park





move my mind around the way your home did

Buffalo cold and snow reaching second story windows  
and you're fleeing to orange trees on the coast,  
pull out the black-and-white photos taken on a farm somewhere

twenty white rabbits and your tin lunch pail  
swinging like the arm that knocked your first front tooth  
while your father was smoking in the hallway

remember your mom alive and young and sitting  
on the dock, can you tell me where she was?  
where she is now? you gave me her name you know,

so, she's in heaven, maybe, and you're in the hell heat  
of Texas after New Mexico's red dirt stains  
heating coffee over a campfire under those tall, tall pines

and you've hiked all over the south and the west  
but now you don't leave your apartment  
and it's been ten years that this place hasn't been your home

can you lead me to where it is? your mind? or is that  
slipping from you too the way it did for Grandmother,  
like a two-day notice "I quit" post-it left on the boss's monitor  
so you can kick your own self to the curb

# The Regional Ramifications of Glacial Melting

By Emma Nault

On the 27th of September 2013, the Intergovernmental Panel on Climate Change (IPCC), presented to the United Nations in Stockholm, “human influence on the climate is clear” (Lenke et al., 2007). In other words, the rise in temperature and its clear correlation with carbon dioxide emissions is no longer merely speculation but rather a globally relevant phenomenon. Climatologists state “the warming of the climate system that we are seeing (in the form of melting ice, temperature rise, and sea level rise, among other factors) is ‘unprecedented over decades to millennia’” (Mooney, 2013). Scientists can say with confidence that humans are majorly responsible for global rise in temperature. In fact, “a 40 percent increase in carbon dioxide has occurred since pre-industrial times” (Mooney, 2013). Last and probably most resonant is the scale of our impacts, “much of what we are doing to the planet is irreversible; temperatures will remain at elevated levels for many centuries, even if we completely stop emitting carbon dioxide” (Mooney, 2013). Ultimately, we have established an evidence-based but rather broad perspective on global warming. Scientists’ concerns are legitimate. Environmental change should be considered an “elusive hazard,’ cumulative, diffuse, slow-acting and insidious—a universal threat” which will only continue to evolve (Jones, 1993). The current challenge for the science community as well as policy makers is to couple this long-term perspective with immediate actions. Efforts must be funneled into local, remote communities who are experiencing the effects of drastic changes in climate currently. Rather than compensating retroactively, local and national governments should act offensively.

Glaciers have existed for one million years. They can be defined as thickened ice masses and compacted snow that presently take up nearly 10% of all land

area on Earth. The advances in glacier mass that we see in destinations like Alaska and Greenland originated during the “Little Ice Age” and can date back to the 17th century (“All about Glaciers”). Although the face of glaciers have always ebbed and flowed as a result of temperature fluctuations, scientists say “the polar ice cap is now melting at the alarming rate of nine percent per decade...thickness has decreased 40% since the 1960s” (“The Consequences of Global Warming”). So who is responsible for defacing these frozen prehistoric land masses? The trail of water can be traced back to humans and the common industrial practice of burning



“Scientists can say with confidence that humans are majorly responsible for the rise in temperature.”



fossil fuels as a source of energy over the past 250 years. Since the end of the Industrial Age in the mid-1800s, damaging pollutants of carbon, coal, petroleum, and natural gases have entered the atmosphere at an exponential rate. These harmful emissions make up the world's greenhouse gases. These gases accumulate in the atmosphere, capturing long-wave radiation or heat energy rising from the surface of the Earth (Dow and Downing, 2006). Consequently, this trapped radiation is redirected back into lower atmospheric levels and causes a slow, but steady rise in global temperature (Bolin, 1986). Increase in global temperature causes the surface layers of glaciers to reach their melting point, ultimately melting the faces of these dense ice monuments at an alarming rate ("All about Glaciers").


It is in best global interests to establish a mutually-beneficial communication between international or national organizations and local, humanitarian work efforts within communities being affected by glacial

melting. Combined with firsthand experience from locals, a larger entity can provide the means for research and necessary provisions. This cross-level communication will ensure impacted communities remain safe and positively impact their economic livelihoods.

As stated, an irreversible level of gaseous carbon dioxide has accumulated in Earth's atmosphere at a compounding rate. From 1990 to 2011, "emissions totaled 6,702 million metric tons... an eight percent increase" (Environmental Protection Agency). Perhaps the most startling statistic is data in scientific models projecting future carbon levels. Even if carbon emissions were to completely cease, atmospheric temperatures are not expected to decrease significantly (Soloman, 2009). In other words, with the industrial world's heavy dependence on burning fossil fuels as an energy source, climate change is somewhat irreversible. Like a domino effect, the polluted state of the atmosphere initiates a series of environmental detriments such as "artic sea ice retreat, increases in

heavy rainfall and flooding, permafrost melt, loss of glaciers...changes in water supply...inundation of low-lying coastal areas" (Soloman, 2009). This is positive feedback. Today, glaciers retreat at a rate twice that of the previous decade (Dow and Downing, 2006). If humans were to sustain these record-highs, glaciers will disappear—there would be nothing more to melt. This is why glacial retreat poses an incredible threat to coastal populations world-wide. The unfortunate timeline for these communities depends on the day we decide to lessen dependency on fossil fuels, and a peak atmospheric level of carbon dioxide output is reached. For now, levels continue to rise.

Shifting to a regional perspective, how does increasing use of fossil fuels threaten local communities in remote locations of the world? Today's scientists should hope to challenge broad approaches by major governmental organizations (IPCC). These general commitments, although positive, inadvertently overlook neighborhoods that are current targets due to the indirect effects of climate change like glacial melting. In fact, global temperature rise includes many geomorphological effects including "changes to agricultural systems, alterations in ice-volumes and



with confidence that  
responsible for global  
temperature. ”

snow-cover, and increases in sea level” (Jones, 1993). Major organizations focus the majority of resources on the scientific process behind climate change prevention. Ultimately, they fail to simultaneously dedicate resources to the people who are currently being affected. Climatologists are working to find a tolerable level of greenhouse gas concentrations (Dow and Downing, 2006). The United Nations Framework Convention on Climate Change’s (UNFCCC) Kyoto Protocol states: “International negotiations have set 2 °C as a common temperature for maximum global climate change” (Dow and Downing, 2006). The protocol plans to regulate the number of emissions a country can produce each year (Dow and Downing, 2006). Although these regulations hold potential, setting climate change to a merely tolerable level doesn’t exactly get the job done. Rather, it distracts from more strategic policies that can be implemented such as direct policies that could result in tangible progress in the fight against climate change.

**“Scientists were motivated to research possible links between the changing climate and its resulting environmental effects on small-scale regional areas.”**

Attention could be focused on environmental phenomena in cities with similar geographical structures to Huaraz, Peru. Huaraz is located below Lake Palcacocha, a glacial lake formed by the erosion and run-off of surrounding glaciers. On December 13th, 1941 the residents of this small South American city experienced one of the many regional consequences of temperature rise: glacial melting. The Quilcay River connecting Huaraz to higher-elevated Lake Palcacocha flooded and accumulated a large amount of debris in its current as it sped for the city. According to record, “an estimated 5,000 people perished in Huaraz that morning, and one-third of the city was obliterated” (Carey, 2010). Prior to the 1940s, the majority of research conducted on climate-glacier dynamics focused solely around the Ice Age and the “advance and retreat of continental ice sheets thousands of years earlier” (Carey, 2010). However, with the destruction of Huaraz came a whole new scientific perspective toward changing environmental conditions. It seemed that with documented natural disasters, scientists were motivated to research possible links between the changing climate and its resulting environmental effects on small-scale



regional areas. Peru’s disaster served as a motivator for more expansive research on glacial retreat. However, this time the approach was specialized and focused locally, shifting the perspective.

A comparison is drawn to countries in Central Asia. Areas like Tibet are resource-dependent on glacier run-off as a form of hydropower, a source for crop irrigation, and a water supply to the nation’s families. The Tibetan plateau holds the nation’s third-largest store of ice. Regions in China have come to rely on the exponential melting speed of the Tibetan glaciers. Chinese climatologist, Qin Dahe, recognizes the terminal benefit of glacial run-off: “In the long run, the glaciers are vital lifelines for Asian rivers, and once they cease to exist water supplies in those regions will be in peril” (“Global Warming Benefits”). Heavy reliance on an exhaustible resource may force countries to lose their economic independence and heavily rely on other countries for food exports or even water supply as “nearly three billion people live in areas where water demand outstrips supply” (Dow and Downing, 2006). Water scarcity is a major economic factor for certain regions. In northern India, “500 million people rely on the Indus and Ganges, which are fed largely by glacial melt waters” (Dow and Downing, 2006). Even Huaraz, Peru “always





used glacial runoff for irrigation and drinking” (Carey, 2010). How can countries like these lessen the risk they take when relying on severely depleted and exhaustible resources? Although some countries have implemented development of water-saving technologies and more efficient irrigation methods, this expensive adaptation is unsustainable for a developing country with costs being estimated at nearly \$20 billion a year (Dow and Downing, 2006).

This argument is perhaps most applicable to coastal communities located on intermittent islands like the Maldives off the coast of India. The Maldivian Islands, a nation of 360,000 people, faces the possibility of inundation within 100 years. One of the first countries to sign up for the Kyoto Protocol, this series of islands has expressed many concerns with the side effects of global warming, especially in consideration of sea level rise (Bryant, 2004). The Maldivians are already taking precautions with the capital, Male, aimed to construct a “3m-high (9.8ft) wall...at a cost of \$63 million” around the perimeter of the city (Bryant, 2004). Unfortunately, the nation was unable to acquire adequate funding for the preventative project. The nation ultimately accepted financial aid from Japan. Yet this wall serves only as a short-term solution to strong tidal surges, which the

nation experiences weekly, and ultimately ignores the fact that sea levels will continue to rise. Aware that the wall’s relief is only temporary, a majority of residents on Kandholhudhoo, one of the most populated Maldivian islands, have agreed to evacuate within the next 15 years. The rest, officials believe, will also be compelled to leave. The Maldives’ communities are preparing to experience large damages to their livelihoods: loss of fisheries, a decrease in tourism due to epidemics and the destruction of agricultural crops all due to the regional effects of climate change (Bryant, 2004). In summary, these coastal communities will be so prominently affected that some may cease to exist within a few years.

Consequently, it is vital that the world’s scientists and general public shift their understanding to incorporate both a broad perspective of global warming and a more localized and region-specific view. This new approach would publicize the effects of climate change on the livelihoods of vulnerable populations and put a public face to climate change. Government officials and most civilians are aware of the long-term effects of global warming and how it contributes to Earth’s seemingly slow deterioration. Unfortunately, we are little versed on the short-term and present day effects experienced by the previously highlighted communities. As stated by

the Union of Concerned Scientists, “We must work to effectively manage the unavoidable, and take immediate action to avoid the manageable” (“Global Warming Solutions”).

Populations and their legislators should all continue to incorporate steps outlined by climate officials to reduce the amount of fossil fuels burned each day including using less electricity, placing limits on carbon dioxide emissions and more. These small efforts can reduce the negative impacts of warming over time on a globally-united scale. Priorities should also include what more developed nations could do to aid remote regions being directly affected today, as it is the habits of developed countries that live in the closest association with changing climates and unregulated fossil fuel use that instigates a rapidly changing climate. Ignorant lifestyles affects smaller, distant populations on a larger and more tangible scale. Some citizens in the United States may never witness the direct effects of climate change within their immediate environment.

Developed nations need to invest in an adaptive, region-specific approach to disaster economics. This can otherwise be defined as the use of a catastrophe, disaster, or disaster prevention program “to promote and empower

a range of economic development interest” (Carey, 2010). Unfortunately, it is difficult for countries suffering from other pertinent foreign and domestic crises to think so long-term. For many countries, environmental awareness often takes a backseat compared to other policy problems. Governments may find a greater motivation to act if they were to see signs of significant progress being made within their own borders. For example, countries like the United States have been hesitant to fully accept and incorporate advances in environmental legislation like carbon dioxide emission reduction. This is because American energy supply greatly depends on mass burning of fossil fuels. A relevant and efficient plan might motivate countries to participate more. For the United States, a potential solution could be devising a plan for rising threats to port cities such as Los Angeles and New York’s own water level—an idea for introducing the effects of climate change to cities “closer to home.”

Continuing global research is crucial. Climatologists should welcome new areas of research in areas most affected by global warming such as neighboring glacial communities, coastal populations, or port cities. By sending teams of climatologists to collaborate within these small communities’ pre-existing humanitarian





efforts, the global scientific community could adopt a more tailored understanding of the damage climate change has already caused as well as the future threat it poses.


Concerning the implications for coastal communities, an idea would be to “restrict major development to less dangerous zones” (Dow and Downing, 2006). Policy makers could take Maldivian coastal communities into consideration, adopting their strategy to delay their fates by encouraging forestation close to shore lines. For communities that neighbor glaciers, decision makers could model the innovation from regions like Peru and Nepal. Both have made efforts to control volatile levels of water that threaten to burst weak natural dams and destroy cities lying below. They have begun draining lakes either into the ocean or to an adjacent and more stable lake nearby (Carey, 2010). For countries like China who depend highly on glacial run-off as a resource for hydropower and water supply, mandates have been passed to find new, renewable ways of supplying energy (“Global Warming Benefits”). Actions like these should be taken in accordance with those already promoted by the IPCC.

With this coordination, target nations would benefit immensely given consistent communication between international organizations and regional efforts. An “inter-agency coordinated response” between local humanitarian projects in environmentally-affected regions and well-established larger organizations should be established (“IASC Case Studies”, 2010). A regional scientist brings something different to the table; their perspective is localized, personal, and motivated. The communication should follow a schedule with meetings in which regional teams can report findings that highlight the current ecological needs of the community. In discussions, locals should convey a sense of immediate urgency to larger agencies (“IASC Case Studies”, 2010). The larger agencies can be responsible for acquiring a source of funding by appealing to state governments or legislatures. Concurrently, organizations should continue to promote general climate change education to the general public, thus ensuring long-term environmental progress.

One of the greatest success stories concerning inter-agency communication involves the progress made by the Inter-Agency Standing Committee (IASC) and their “advocacy to mainstream climate change adaptation” and disaster-risk reduction. One of the IASC’s main mandates is to “lead the preparation of high-quality analytical inputs to the United Nations Framework Convention on Climate Change (UNFCCC) process...

integrating climate risk management into agency policies” (“IASC Case Studies”, 2010). Through their work, many government-humanitarian discussions have taken place. For example, in Africa the Kenyan Climate Change Working Group is focusing on Kenyan-specific climate change and its greater implications for the nation such as potential for malnutrition, flood hazards, epidemics, and mass migrations (“IASC Case Studies”, 2010). This creates a strong and internationally recognized African position on climate change. Other examples of successful regional-national-international partnerships include coordination of humanitarian groups on islands like the Maldives with Red Cross programs. The Red Cross has initiated “training volunteers, distributed satellite phones to facilitate emergency coordination and established school children awareness raising programs” (“IASC Case Studies”, 2010). However, humanitarian efforts still struggle with maintaining a balance between fixing the short-term problems versus maintaining long-term disaster risk reduction (“IASC Case Studies”, 2010).

All efforts cannot be made without a firm base in education. A primary education introducing environmental science, followed later by a secondary education highlighting climate change, would be a huge asset to all nations. Knowledge in this evolving field is fundamental in creating future scientific leaders who can foster a better environment for tomorrow. Like the Maldivian Islands, all education systems should incorporate some kind of base in environmental awareness and the opportunity to pursue a more extensive understanding in ecological sciences.

Underrepresented regions must be made a current priority in the battle against climate change. They must serve as case studies in the fight against climate change. This will teach a greater understanding and provide the world, scientists and citizens alike, with an all-encompassing approach to creating a better environment for future generations. 

## AUTHOR’S NOTE

I completed this paper my very first semester at Elon University. Even though I was undecided on what type of science education I would pursue, I chose to write my final global experience paper on the topic of climate change. Four years later, I have decided to pursue a career in climate change research and education. Although this was my first research paper, I chose to share it with Visions as a source of education for the magazine’s followers. The general idea of maintaining both an immediate and long-term perspective in the fight against climate change is important now more than ever.

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# After the Rain

By Brittany Coppla

Photo by Brittany Coppla '18

Flower petals lie as sleeping lovers,  
dewed with sweat in a locked bedroom  
after midnight.  
Between suspended breaths,  
both are still.

From below, the grass's fingertips  
cradle the petals.  
Their canopy shields the sunlight,  
as if they whisper,  
*Learn from us.*

Above them, a set of eyes catches  
the fallen lashes of distant flowers.  
The petals quiver under the wind's breath,  
as if to sigh,  
*maybe tomorrow,*  
before blowing away.



# Bioremediation

## Solution to Soil Contamination For Urban Farming

By Chloe Donohoe

### URBAN AGRICULTURE AND ITS IMPORTANCE

Urban agriculture plays an increasingly important role in localizing food systems in urban areas while reducing the consumption of resources used to produce and distribute food (Green, 2008). Other benefits include the promotion of crop diversification, improved access to healthy food in terms of availability, and access to culturally appropriate food (Green, 2008; Hagey et al, 2012). Urban agriculture additionally improves economic health through the creation of jobs, increasing skill development of the workers, and offsetting family food bills while simultaneously revitalizing communities by strengthening relations and feelings of belonging (Hagey et al, 2012).

However, as urban agriculture becomes more prevalent, pertinent issues will need to be addressed, especially the need for space to produce food. Studies of urban areas have found that much of the vacant land available for urban agriculture is likely to be contaminated with pollutants (Green, 2008). Although critics of urban agriculture production have deemed available urban areas too contaminated for food production, they are likely only considering physical and chemical methods of land remediation, which tend to be expensive and are associated with a decrease in soil health (Green, 2008).

This report addresses the viability of alternative methods that use the natural processes of plants, microbes, and fungi to remediate soil for urban agriculture, allowing communities struggling with food insecurity to realize a newfound freedom and understanding of food production.

### DANGERS AND SOURCES OF SOIL CONTAMINATION

According to Ja Schindler, “Soil is a living material composed of minerals, organisms, and the gasses and water in between. Likened to an organ for the Earth, similar to our skin, it is teeming with an enormous diversity of beings, both macro and microscopic, sharing an array of landscapes, food sources and social roles” (Schindler, 2012).

When the soil is contaminated, the ability to produce food and sustain a community is compromised. Contaminated soil affects many aspects of the urban agriculture system. Plants and groundwater can become contaminated through interaction with the soil. Furthermore, bioaccumulation may affect living organisms as these harmful materials are collected in natural sources (Rosen, 2002). For these reasons, human health is a primary concern for urban gardeners (Heinegg et al, 2000; Surls et al, n.d.). Health risks can result from the occurrence of organic compounds, persistent environmental pollutants, heavy metals, pesticides, and polychlorinated biphenyls (PCB's) found in the soil (Turner, 2009).

The most harmful contaminants tend to come from human activity and can be determined from research into current or past land use, as well as proximity of point source (Turner, 2009). Many locations may contain fuels and lubricants from gas stations or mechanic garages, which have been known to contaminate the land years after use due to previous poor storage practices or spillages. Contaminants may also come from movement of groundwater from adjacent properties that have been



inundated with these substances. In her research for the University of Louisville's Center for Environmental Policy and Management Environmental Finance Center, scientist Allison Turner found that contamination is more likely if the site was used for the production or use of lead paint, high traffic, fertilizers or pesticides, industrial or commercial activity, treated lumber, petroleum spills, automobile or machine repair, junk vehicles, furniture refinishing, fires, landfills, or garbage dumps (Turner, 2009). Some contaminants are intentionally added to the land, such as pesticides and fertilizers, while other are unintended, like accidental spills or leaks (Turner, 2009). Contaminants can also move into and out of soil through air, dust or precipitation. Contaminants such as lead and mercury are commonly spread through runoff from roads, roofs and other structures as their fluid state allows for simple dissemination. Many of these common contaminants are listed in Table 1.

governments stress the importance of having minimal levels of these contaminants present in the soil, especially in areas used for food production (Heinegg et al, 2000). Therefore, it is essential for urban agriculturalists to determine the concentration of contaminants in the soil through soil testing in order to pick the best remediation strategy (Green, 2008; Surls et al, n.d.; Turner, 2009).

BIOREMEDIATION

Bioremediation is a land restoration method that works with living systems to detoxify contaminated environments. This method has significant potential for improving soil health in urban areas. It contrasts with many conventional remediation practices that use chemical and engineering-based approaches. Unlike these conventional practices which actually remove contaminated soil, bioremediation is performed on-site (Turner, 2009).

Table 1: Common Sources of Contamination

General Source	Specific Contaminant
Paint (<1978)	lead
High Traffic Areas	lead, zinc, PAHs
Treated Lumber	arsenic, chromium, copper
Burning Wastes	PAHs, dioxins
Manure	coppers, zinc
Coal Ash	molybdenum, sulfur
Sewage Sludge	cadmium, copper, zinc, lead, PBTs
Petroleum Spills	PAHs, benzene, toluene, xylene
Commercial/Industrial Site Use	PAHs, petroleum products, solvents, lead, other heavy metals
Pesticides	lead, arsenic, mercury (historical use), chlordane and other chlorinated pesticides

Source: Heinegg et al., 2000

The type of contaminant determines its properties and the ways in which it interacts with plants in the soil. Organic chemicals, like hydrocarbons and pesticides, can be broken down or transformed while heavy metals cannot. Heavy metals need to be extracted by sequestering them or binding them in the soil to make it more difficult for them to be taken up by plants or moved into the water table (Darwish, 2013). Roots and tubers are more likely to have a higher level of heavy metals like lead and cadmium because they have more direct contact with contaminated soil than the leaves and stems of above-ground plants. Fruits and seeds usually have the lowest amount of heavy metals. However, leafy vegetables tend to become contaminated from soil splash and dust. Therefore, washing and peeling can remove up to 80 percent of soil contamination (Turner, 2009).

Agricultural standards set by local and state

Heinegg et al. discusses different frameworks to consider when determining the best bioremediation technique for a site intended for urban agriculture (Heinegg et al, 2000):

- Accessibility: Is this technique readily available to your group? Is it commercially available?
- Cost: Is this technique affordable, considering the cost of consulting and soil testing?
- Timeframe: How long will this technique take to produce results?
- Effectiveness: Is this the best technique to bring the soil up to agricultural standards?
- Environmental Effects: How environmentally sound is this technique? Will there be hazardous by-products?

## OTHER DANGERS OF SOIL CONTAMINATION

Microbial remediation uses microbes to degrade contaminants to a less harmful form. This technique is considered enhanced and/or intrinsic biodegradation because the microbes use the contaminants as food sources or metabolize them with food. This technique can also be used to bind metals in more inert and less bioavailable forms (Darwish, 2013).

Biodegradation of contaminants is facilitated in two ways: (1) by breeding a large number of bacteria and introducing them into the contaminated areas of the soil through aerobic compost, compost tea, or a commercial mix, or (2) by creating the ideal conditions for bacterial growth. One can introduce microbes into the soil through thermophilic composting, vermicomposting, and applying aerated compost tea (Darwish, 2013).

There are many practices that can increase the efficiency of microbial remediation. The warmer the soil and the more oxygen molecules available to the microbes will allow for faster biodegradation. One should also introduce or create an ideal environment for a diverse amount of microbial species, since one type of microorganism will not be effective at degrading all types of contaminants (Darwish, 2013).

Microbial bioremediation is extremely effective at treating hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), pesticides, and PCBs (Heinegg et al, 2000). It has a relatively affordable cost and short timeframe of remediation. However, since there are certain metals that microbes cannot degrade, there is a possibility of increased toxicity of certain metals (Heinegg et al, 2000).

## PHYTOREMEDIATION

Phytoremediation uses plants to extract contaminants or degrade them in soil (Pinto et al, 2014). Phytoremediation functions through the storage of contaminants in plant tissues. As a result, some of the plants are removed as toxic waste or the plants break down the chemicals and transform them (Darwish, 2013). There are six practices of phytoremediation currently being practiced. Plants can help bind, extract, transform and clean up many kinds

of pollution including metals, pesticides, chlorinated solvents, polychlorinated biphenyls (PCBs), explosives, radionuclides and petroleum hydrocarbons (Darwish, 2013; Rock et al, 2010). Specifically, phytoremediation has shown promise in cleaning up soils contaminated with metals like cadmium, zinc, and copper, but it is contested whether or not it is effective for lead.



Phytoextraction occurs when hyperaccumulators take up contaminants. These levels of heavy metals exceed what is needed to grow; therefore, this practice is seen as a plant adaptation to heavy metal stress. This method is seen as the most promising for commercial application (Pinto et al, 2014). Examples of hyper-accumulators that



have been studied include Alpine pennygrass, Rockcress, Indian mustard, and Alyssum sunflowers (EPA, 2006).

Other methods include phytodegradation, which is when plants take up and break down contaminants through metabolic processes (EPA, 2006). There are four specific subcategories of phytodegradation. Phytovolatilization is when plants take up volatile

assists in the degradation process. Rhizofiltration is when the roots filter the contaminated water. Phytostabilization is when a plant cover is grown on the contaminated site. The contaminants are sequestered or immobilized by absorbing into the roots and a chemical is then released by the plant that converts the contaminant into a less toxic state (Darwish, 2013; Rock et al, 2010).

Phytoremediation is facilitated by adding compost to create healthy soil, allowing for better extraction of contaminants. One should also adjust the soil pH and add amendments to the soil to allow for better extraction and immobilization of heavy metals. Immobilizing the toxic contaminants makes them less bioavailable, while affecting the soil pH is important because alkalinity and acidity of soil affect bioavailability of metals (Darwish, 2013).

The cost of phytoremediation is fairly low—about one tenth the cost of soil removal (Green, 2008; EPA, 2006). However, there are limitations. The timeframe in which phytoremediation can be carried out can be several years, and since the remediation process is limited by the depth of the contamination, phytoremediation works best at sites with low to medium pollution (Darwish, 2013; Green, 2008). The contaminated plants also must be disposed of properly because they are considered hazardous waste (Green, 2008; Rock et al, 2010).

## FUNGAL REMEDIATION

Fungal remediation is also called mycoremediation. This method utilizes certain types of fungus to degrade contaminants (Turner, 2009). The specific fungus involved the saprophytic fungi family of decomposing fungi that produce powerful digestive enzymes. The same enzymes that break the chemical bonds in cellulose and lignin have also been shown to degrade many toxic and highly persistent chemicals. Furthermore, fungi used for remediation can sequester

or accumulate high concentrations of contaminants (Darwish, 2013). The issue with this method is that it is not commercially available; however, it carries great potential for expansion for urban agriculture purposes (Darwish, 2013; Turner, 2009).



contaminants and release them into the atmosphere through transpiration. The contaminant is degraded into a less toxic state and then released into the air (Darwish, 2013). This method is seen as the most useful for the removal of mercury (Rock et al, 2010). Rhizodegradation is called plant assisted degradation where the root zone

## OTHER METHODS OF REDUCING CONTAMINATED SOIL

One method is to adjust the soil pH to near neutral. Most metals are more bioavailable in more acidic soils and can harm plants or animals when pH is too low. Most plants will thrive at pH 7; however, some may require an adjusted level ranging from pH 6.2 – 6.78. Another method is to add organic matter, like composted leaves, neutral (non-acid) peat, and well-rotted manure to the soil, which can significantly reduce the availability of lead and other heavy metal contaminants (Rosen, 2002). A garden planner should not grow edible produce directly adjacent to buildings as this is where lead levels are likely highest (Green, 2008). If remediation is not possible or is limited, build raised beds with clean soil to grow food crops separately in more contaminated areas. Regardless of its source, even soil in raised beds should be tested to determine toxicity and nutrient levels. The lumber in the raised beds should not be treated with chemicals that may further contaminate the soil (Turner, 2009). Some garden crops are less likely to be contaminated. Garden crops that are most recommended are vegetables, fruits, and seeds like tomatoes, eggplant, peppers, okra (seed pods only), squash (summer and winter), corn, cucumber, melons, peas and beans (shelled), onions (bulb only) and tree fruits like apples and pears (Turner, 2009).

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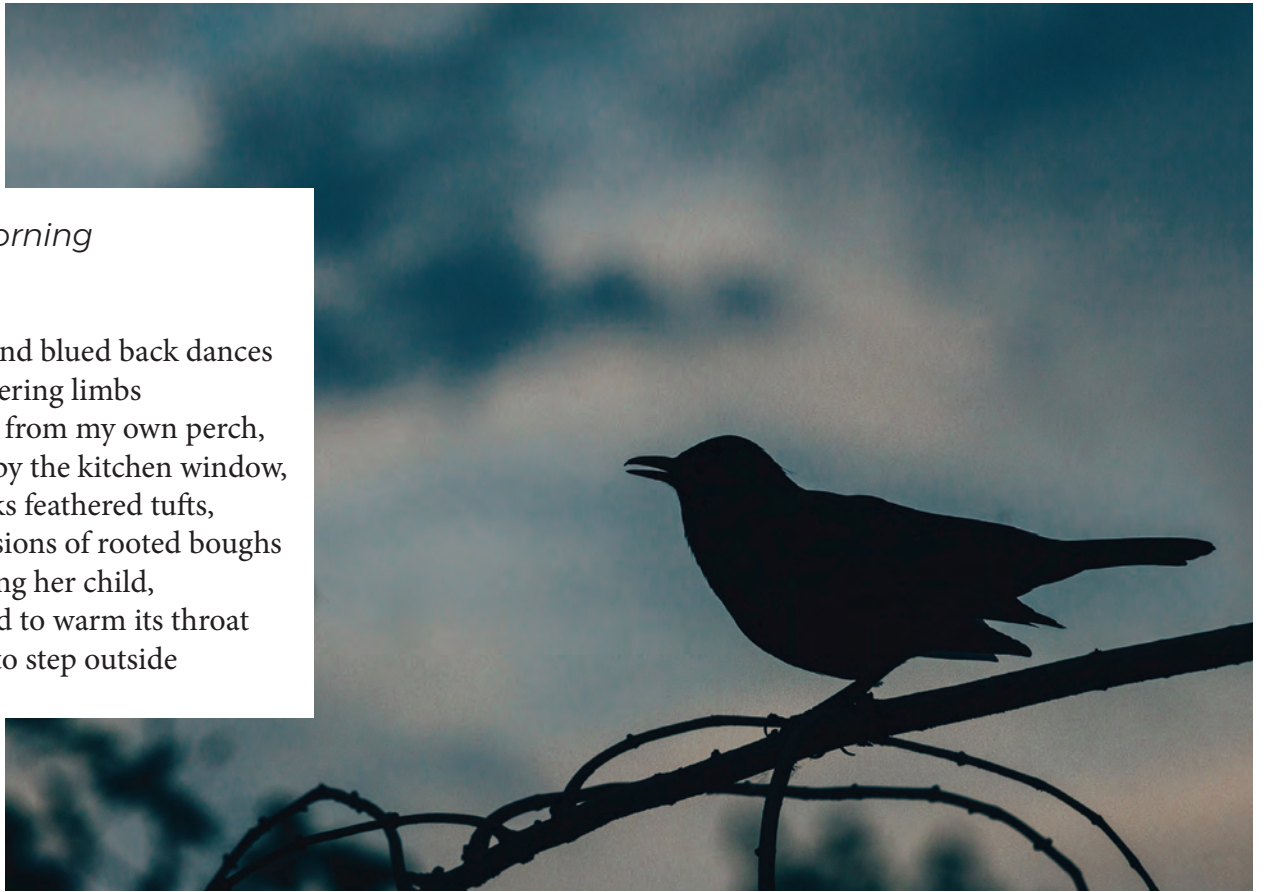
Photo By Katee Fletcher '19



*November's Morning*

By Alissa Park

the red dirt belly and blued back dances  
on the birch's wintering limbs  
as if to remind me from my own perch,  
the wooden stool by the kitchen window,  
how the wind perks feathered tufts,  
sways aging extensions of rooted boughs  
as a mother cradling her child,  
and coaxes the bird to warm its throat  
by singing a song to step outside



*the still of late October*

By Alissa Park

this morning the pond is glass,  
smoothed slick without  
the exhaled rippling of life,  
and I think about pressing  
my body against it -  
as if it were ice and me  
something light and fearless,  
sprawled over this body  
that bears bodies,  
imagining the separation  
just enough for the bluegills  
to come close

# Film Reviews

By Chloe Donohoe



## Food, Inc.

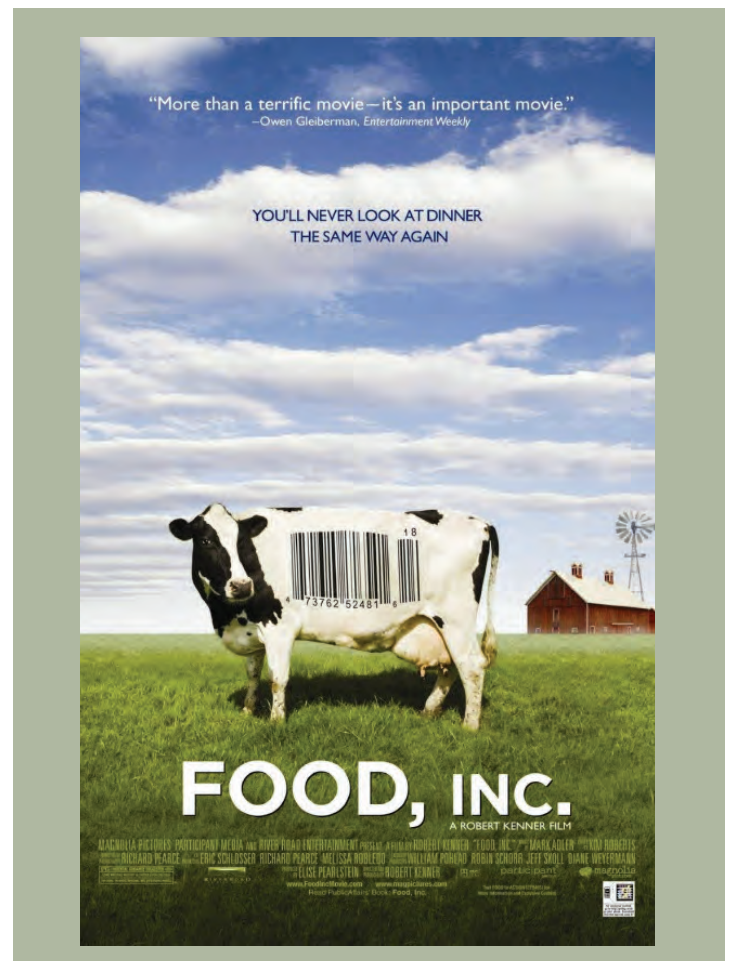
Film by Robert Kenner, Elise Pearlstein and Kim Roberts

*Food, Inc.* was written by Robert Kenner, Elise Pearlstein and Kim Roberts. It was directed by Robert Kenner, who has produced films and television shows for PBS and *National Geographic*. He more recently filmed and produced a documentary called “Merchants of Doubt,” an exposé on the people who benefit from the destructive industries that have contributed to climate change. In this way, the film highlights the important link between our current food systems and the adverse effects it has on the environment.

According to the film, the concept of a grocery store has created a façade of year-round availability and abundance. Many of the 4,700 products that are available to us in the grocery store still utilize images of traditional farming practices, such as farmers with pitchforks and cows grazing in wide-open prairies; however, these depictions are largely false representations. For profit-oriented companies, maintaining that image promotes a desirable vision of a classic American element. Widely-known meat companies have engendered a significant amount of critique in recent years for their treatment of their suppliers and the animals. Kenner highlights different farmers who produce for Perdue, all of which are in debt and, therefore, must utilize their high-production technologies to produce more food for less money. The farmers in the situation are essentially trapped, which is highly concerning. Even if they do not agree with the practice of keeping thousands of chickens in a small confined space with no light, they face a termination of their contract and thus a loss of income if they do not comply.

The illusion of choice in grocery stores masks the reality that there are only a few companies utilizing a few crops to produce most of the products we consume. The Farm Bill of 2008 passed by the government produces subsidies that favor commodity crops such as soy and corn, resulting in 90% of the products on the shelves containing those ingredients. Since these crops are

incredibly inexpensive, they are fed to cattle and most other animals raised for consumption. However, their digestive systems are not equipped for corn or soy, causing an excess of methane to accumulate in their stomachs and then release into the atmosphere and contribute to greenhouse gas emissions. Additionally, a mutation of *E.coli* is occurring among cattle and the meat product produced from them because of their stifled confinement and unclean manure-packed living quarters. Through the meat-processing system and its accompanying runoff, this mutation is transmitted into our food and causes thousands of outbreaks a year. The movie highlights the particular story of a woman whose son was stricken and killed by an *E.coli*-contaminated burger. Her experience motivated her to fight for a bill containing better food safety regulations, but the current amount of influence from food and meat companies within the political system has prevented the bills from being successful.





As another farmer featured in the film notes, the people making the decisions about food safety and regulation are not living with the consequences. The documentary then shifts to focus on the exploitative practices in the meat-packing industry. Often, workers within the industry are subject to similar derogatory treatment from companies. At Smithfield, many of the workers are undocumented and are illegally exploited for their labor. However, an agreement between Smithfield and immigration officers allows regulators to deport fifteen undocumented workers per day so that production is not affected. This example illuminates the high environmental and social costs of the manipulation that exists within our current food system.

The film goes into the power of Monsanto, a monopolizing agribusiness, not only among farmers but also among our political leaders, many of whom are affiliated with Monsanto in some way. Agribusiness companies are thus given centralized power to use against farmers, workers and consumers. Promoting consumer awareness about the processes involved with the food they purchase is the overarching goal of the film. This is an especially crucial message because the food and meat industry has managed to criminalize any criticism against their products through various laws and acts. The film emphasizes that Americans must vote with their food choices and reject the hypocrisy of the system.

Several factors of the film contributed to the communication of its overall message. The exposé components of the movie were powerfully portrayed, and the film directors did a thorough job of debunking the myths and presumptions surrounding the food system. While our diet has changed more in the past fifty years than in the last ten thousand years, American consumers are largely oblivious to the implications this has regarding environmental and social issues. One result of this is the reality that nutrition and food choices are controlled by companies who have little interest in our well-being, which also serves as a critique towards the ambivalence of the public.

Environmental and place-based education needs its students to ask important questions about where our food is coming from and how our current system impacts

all aspects of our lives. A part of the film discussed Stonyfield as a pioneer for more honest food production practices, and I felt like the film could have included more farmers and people who are practicing sustainable production or are researching beneficial solutions. This could provide the audience with more information and advice on where to go and what to do post-viewing. I like that this film highlighted the hypocrisy in many aspects of the food system beyond cruelty to animals. Although the images were graphic in many instances, which may deter some from viewing, this movie is a worthwhile production because of the important topics it discusses and how it evokes a response from the audience. For example, writing to a political representative about food safety or researching companies, whose practices are environmentally and socially sustainable, are examples of actions that should become a more prominent facet of the American consumer's lifestyle in order for detrimental situations to change.

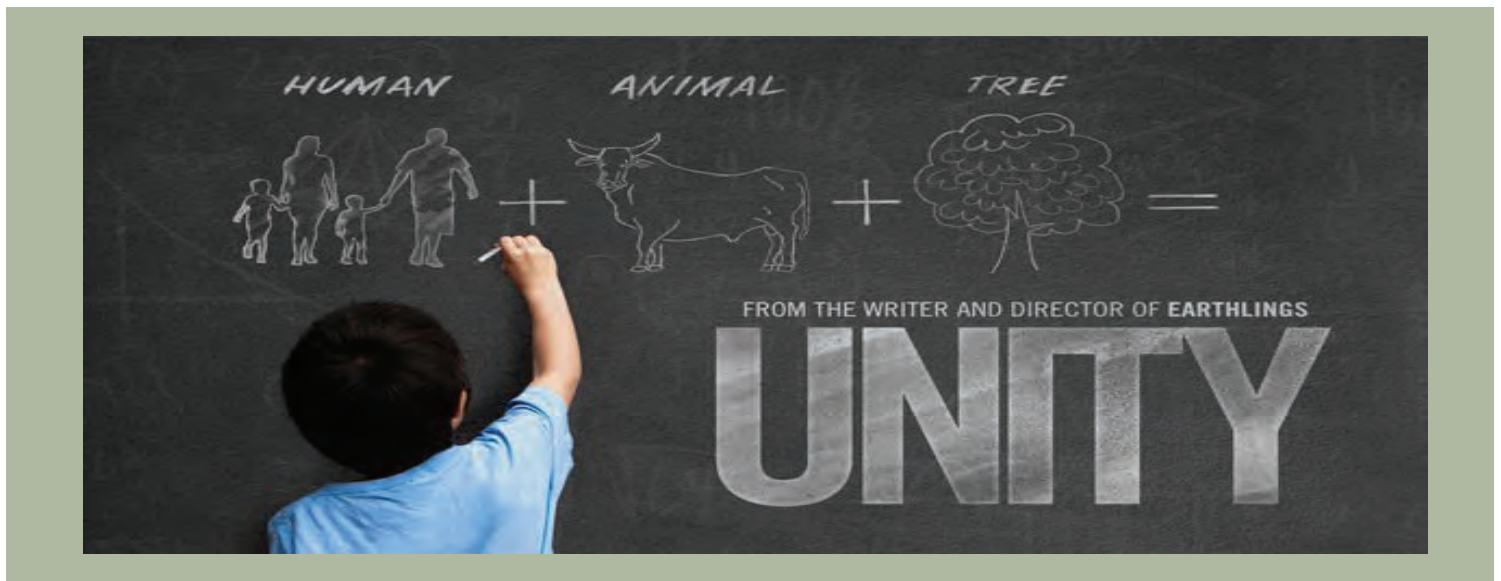


## Unity

Film by Shaun Monson

*Unity* was written, directed, and produced by Shaun Monson, an environmental rights activist and filmmaker. The piece is intended to be a sequel to his 2005 production of *Earthlings*. *Unity* utilizes the theme of consciousness as a means of comprehending and rectifying the cause of many universal problems and environmental issues. The film is split into five chapters: “Cosmic”, “Mind”, “Body”, “Heart”, and “Soul”, providing a structure conducive to a classroom setting featuring discussions at the end of every chapter.

“Cosmic” discusses the immensity of the universe contrasted with the relative size and role of Earth and the even smaller role that humans play. The film discusses the evolution of the Earth, emphasizing the fact that humans have a weakness for territoriality that fuels our egos and self-importance. The film introduces the idea that every living thing, humans and animals alike, are an energetic charge in the energy field (Earth) that we are all connected to.



The film then transitions into the “Mind” chapter, discussing that we live in a “period of comparison”, where, due to technology, distances in the physical world have been replaced by distances in the mind. The inner world of our minds causes the outer world that we live in with varying consequences. Negative thoughts and egotistical values transform the world into a place of suffering, to which humans are more apathetic than ever before. For example, if one considers that “all humans are strangers of the same blood”, then the idea of warfare becomes an absurd concept. By including disturbing images of war, the film emphasizes that war must end in order to preserve humanity, which stands in direct contrast to 95% of human history. Instead of operating on misguided distrusts of each other, the concept of human rights should be universally recognized and valued. This viewpoint traces its origins to Cyrus the Great and many other leaders who have promoted these ideals throughout history.

The “Body” chapter discusses how consciousness is needed when it comes to our food choices. Often, the foods we consume pollute our bodies rather than cleanse them. The film discusses how the strongest animals, such as horses and elephants, are herbivores while meat is emphasized as the ideal protein in most nutritional communication outlets. We alter the shape and texture of meat to resemble fruit. The way we treat animals for our consumption works against consciousness, which the film describes as feeling the suffering of every being in our hearts.

Living by loving as the only solution is presented by the “Heart” segment of the film. As humans, we strive for emotional exchange and companionship, but we must become egoless and secure in our own abilities without comparison to others. Most importantly, the film calls

for unity amongst all living things that share the Earth. In the “Soul” chapter, the film portrays infancy as the idealized version of life because it contains pure joy despite a lack of material and intellectual possessions, which is upheld as a future model for humanity. We need to evolve beyond any act that destroys life and embrace wholeness rather than separation.

Although this film struck me emotionally, it was almost too conceptual. In a classroom setting, I think that teachers would need a few class periods to prepare students for the philosophical ideas proposed and emphasized throughout the movie. However, a powerful strategy in the film was the use of famous actors, actresses, business figures, athletes, authors, and entertainers as the voices in the film. When I recognized a voice, the importance of the messages communicated throughout the film became especially memorable and significant. I liked the “Body” chapter because it introduced a way of looking at food that is not commonly discussed. We must consume and produce foods that not only fulfill the needs of our bodies but also adhere to ethical values of connectedness. This film did not focus solely on environmental issues, but instead utilized many of the topics discussed to emphasize the need for change; however, I would not say that I finished this movie as a motivated individual. Instead, I felt a sense of hopelessness in a system that I cannot fix. In order to be an effective tool in the classroom, teachers will need to unpack many of the concepts introduced in the film. The imagery and design of this film was powerful, but it could also work in a negative way for students as they are presented with the immensity of war and human suffering. It may make more sense to show only parts of it at a time so that there can be discussion and questions facilitated by the teacher.





# Help me, Walt Whitman

By Hannah Silvers

uninspired by skyscraper spires, I look  
to the rest of the world for answers  
like you did, old man. I know where you found them—  
the beautiful uncut hair of graves—  
but how? in the cemetery where a great grandmother  
fidgets with a worm-hole in her shroud,  
thimble-mesh tattooed into her left thumb-pad,  
the yellow grass slumps—exhausted, choked—against  
the concrete support columns of an I-75 overpass.



# Quercus

By Elsa Dickenson Davis





My limbs feel heavy today. It's rainy, and I sag—down, down, lower, down; creating an umbrella around myself so my dry center stays that way. The grass below me stays clean and dry, arching up towards me in gratitude. I smile down. I look out for them. We look out for each other, I guess. A gust of wind comes our way, and I quiver, doing a kind of backbend, swerving up to stare the grey storm clouds right in their face, in an effort to daunt, to intimidate. My efforts are futile. They growl back at me, and spit more wind my way. I shudder, the way I see young girls shudder when a boy's hand brushes theirs, and a shiver runs through their spine, shaking the remainder of their youth away. I violently shake the rain that I've housed in the umbrella of my limbs everywhere—all over myself, my warm, dry center, and my surroundings. Including the grass. I don't want to look down at them. I'm sorry, I didn't mean to. I'll still look out for you.

As the sun sets, the storm worsens—though the sun wasn't visible before anyway, due to the thick dark clouds that foreshadow this kind of tempest. I try to pull my limbs closer to me, as close as I can. Keep them close, so that they'll stay mine. I hug them to my center, now damp and cold, trying to keep everything else out. The storm cackles against me, it whips me viciously, it beats me with no mercy. The wind tries again and again to pull my limbs from me. It seems to desire them so strongly; it wants them for its own. It will stop at nothing to pry them from my center and carry them away. Why? I'm doing my best, I'm trying to hold them close, but I can only hold on for so long. All I can hope is to outlast the wind, but I can feel it slowly gaining the advantage in this tug of war.

All of the sudden: a deafening crack, and sharp, searing pain courses through all of my being, as one of my lower-hanging limbs is drawn out of my closed huddle and torn away from me mercilessly. It was the most exposed part of me. I guess one of them had to go. The pain doesn't go away, but sweet relief also flows through me, as I no longer have to fight against the storm— it has finally taken its captive, its sacrifice. I bow my branches, and the wind continues to circle around me, tugging at my remaining limbs and leaves, though softer now. It whistles between my browning leaves, composing a melody rather than the nefarious whispers it spat at me moments ago, moments before it claimed for itself a part of me—ripped a piece of me from myself. Slowly, then even more slowly, it dies out, and fades away.

My severed limb lays a few yards away from me on the grass, the grass that looks out for me. We look out for each other. It offers my branch a soft landing. A quiet

place to decompose. A far more opportune location from which squirrels can now harvest my acorns without even having to take the energy to scramble up my tall trunk and into my precarious canopy. Maybe things are better off this way. I'm not, but maybe things are. Maybe they are. Maybe that's good enough.

...

Maintenance comes by in the morning to examine the storm damage. Every tree in sight has had at least one limb taken. The detached branches litter the earth like body parts. As the workers examine the massacre, they bop around from tree to tree, chatting with one another and exchanging ghost stories their families told each other in the power outage during the storm the night before. They shriek at particularly spooky parts, and they all laugh. The park is quiet—everyone else is home, not wanting to venture out in the aftermath of the storm wreckage, and the jolly group's laughter reverberates around the vast space inappropriately, like a giggle in a funeral home. We all look on them with a level of disrespect only attainable by those who have been deeply disrespected.

One of them takes notes on each tree—identifying it, and assessing the damage, while the others load the fallen limbs into a cart. It's hard to watch—the mundaneness of the whole motion. You can tell that they've witnessed this carnage a thousand times; piling the lifeless branches into a cart, tossing them nonchalantly over their shoulders, and moving about their day without a second thought. I wish I could turn away from them and not bear witness.

When they get to me, my heart is sore and I'm deep in grief. So much loss happened last night. I want to mourn my branch. I want to mourn all of the taken branches. I want them to come back so that I can tuck them high in my canopy forever, where they'll be safe. Why doesn't the wind ever blow that way? I bow my branches—my lovely, remaining, healthy, strong branches—in gloom, shading myself. Willows are not the only trees who weep.

"*Quercus*," I hear, as the maintenance workers approach me and gather around my trunk. They squint up into my thick awning of leaves, trying to comprehend all seventy feet of my being. They want to figure me out.

"There's 600 types of oaks, dimwit," comes another voice. "I need a little more than that. Looks like a red oak to me. *Rubra*."

I straighten my spine—as if I had one, as if I could. I am no *rubra*.

"Leaves look like pin oak. See any spiny bits on the

tips? Could be *palustris*.”

I wonder if they can tell that I’m scoffing. Can people tell? When I’m indignant, when they display exactly how little intelligence they possess, and I recognize it, and reject it? I feel like they can. I can tell when other trees are. Though this park is landscaped so heavily that we are more of a display than an ecosystem, I can still tell how they’re feeling. I could tell from a mile away. We were all in mourning, and now, due to their insensitivity and ignorance, we are simply mad. Before they came over to me, I heard them call a blatant sugar maple a silver maple. *Acer saccharum* and *Acer saccharinum* are only two letters, yet millions of genes apart. Far enough apart to not be able to mate and produce genetically viable offspring. Far enough to be considered two entirely different species. Far enough to have two entirely different histories, ancestors, descendents, and pages in a tree ID book. Far enough to earn them those two letters.

By the time the workers leave, they still haven’t figured out what I am. They continue to toss out incorrect guesses, and squabble amongst themselves before finally deciding that, because the tree closest to me is *Quercus alba*, so must I be as well. I’m not. I’m no more a white oak than I am a red oak, than I am a silver maple than a sugar maple, than I am a magnolia than an elm than a willow. Right now, it doesn’t matter what any of us are—for today, species and genera alike and apart, we are all weeping.

...

The next day is Saturday. The sun shines, and my leaves smile. It’s October, and they’ve been under siege of the rainy season for the last month or so. They’ve started to brown, with a few even boasting shades of yellow, red, and orange, but their colors haven’t been appreciated as they usually are. The stormy season has kept attendance low at the park. But today, I am a star. Drones fly above the park, taking bird’s eye footage of the landscape, and local people and tourists alike flock to the park to enjoy the first day of sunshine in too many weeks. They take so many pictures of me. I stand tall; I feel beautiful. I feel loved, and important. Maintenance came back through later yesterday and pruned all of our branches in an attempt to disguise the jagged scars left behind by our severed limbs from the storm. We are all sheared to perfection, once again. Looking perfect for the people. You would never know that we aren’t.

...



A young couple brings a soft red blanket and sits in my shade. I recognize them. They like me, I think. They seem to always come back. I haven’t seen them in a while, but I knew they’d come back. They spent most Saturdays here over the summer. They came for the first time in May, probably. They seemed to be just friends then, but they must be together by now. In June, they walked over to me holding hands for the first time, blushing and looking excitedly nervous, like I had walked in on them. Maybe I kind of did. Every Saturday that they came, they seemed to inch closer and closer together. By August, there was not an atom of oxygen between them.

The girl likes to curl into the V created by my large, protruding roots and read novels while the boy draws. Sometimes she sings. Softly, and subconsciously, it seems, not for anyone else to notice except for them—just melodic notes to punctuate their moments. He sketches her, he sketches me. He sketches the two of them; from his imagination, I guess. He sketches the parents and toddlers running around, and the birds that flutter from canopy to canopy. Those will head South pretty soon. And then it’ll get cold, and the parents and toddlers probably won’t come around as much either. I don’t know if the boy and the girl will want to come sit





on a blanket in my shade if the grass is frosty, and my roots are frozen, and I have no leaves for the boy to draw. I grasp my browning leaves tighter and beg them not to fall just yet.

Today, she is wearing a big yellow sweater. Yellow leaves and acorns litter the ground around her, complimenting her perfectly, as she nestles into the V notch that fits her with ease and leans back against my sturdy trunk. She opens a newspaper and begins to browse the comics, humming along the whole time to a tune that sounds not quite familiar. He listens and just watches her, with the dopey smile of a boy in love. I watch them both. With the look... of a close friend, happy for my friends? I don't know what I am. Or what I am to them. I think I'm just their Saturday afternoon spot. But they don't try to identify me. They just quietly fall in love under my canopy, leaning against my trunk and drawing my leaves. That's all I wanted.

...

Next week, they come back. Like always. I'm happy to see them, and they seem happy to see me. Or maybe they're just happy. They always seem to be. My canopy is

thinning even more than it was a week ago, but the boy doesn't seem to mind. He draws in my stark branches along with the remaining leaves. I think he still thinks I'm beautiful. I'd smile down to him if I could—I rustle a “thank you” to him, shaking my leaves slightly, causing acorns to rain down on them.

They shriek and laugh, and the girl raises her book to cover her head to stop any of my seeds from crash-landing into her. As her hand cuts through the air, a shimmer catches the light, reflecting a bright beam back onto my trunk. I strain to see what it is, and quickly realize that it is a ring. The shiny object grabs her attention as well, and she looks down to admire it. She reaches over for the boy—maybe he is a man, I guess. She must be a woman, too. They seem so young and so tender. They reach to each other. Before I know it, they're standing before my trunk, leaning on each other and laughing; grinning with anticipation. They're talking about something that I can't quite make out. The boy pulls a Swiss Army knife from his pocket, and I'm taken aback. I've never seen him with anything in his hand but the girl's. Or his charcoal pencil.

The first cut hurts the most. It's a shock. The entire time, I allow it to happen as I continue on through a

haze. This isn't happening. It can't be happening, right? I'm not really sure why they want to hurt me. The boy and the girl aren't supposed to be like the wind and the storm. The wind is ruthless and the storm is nasty. I thought that the boy and the girl were neither of those things. If I could cry, I would. Once it's over, they step away to admire their handiwork: a jagged heart, and the day's date carved within it.

They've scarred my bark, and they've scarred me. My cool, rough bark—it has offered the girl a place to rest her back, it has protected me through all forms of weather. I've been growing it for almost 200 years now. They're so pleased with themselves. I want them to leave. Please don't come back.

Being almost 70 feet tall and seven feet around, one scar on the surface of my trunk seems small. Unimportant. Especially when I've just lost a branch— a far more staggering portion of my mass than a few scratches in my trunk. However, we all lose branches. It is tragic and it is upsetting, but it is by fault of the storms, the winds, the natural forces of the Earth that we must expect and

“When I hit the ground, it's not as hard as I expected. The grass softens the blow, and lifts me up off the earth. It's always looking out for me. I'll miss it, I think. I hope it will miss me too.”

we ultimately respect. We all lose branches. We aren't all branded, scarred. Those acts come only by the hands of people. Humans. Those stupid beings, who can clean severed tree limbs without blinking, who can come and see me only when the weather suits them, who can't even properly identify half of the trees in this park.

The boy and the girl stick around a little while longer. The boy wants to draw my new tattoo, with the girl curled against the tree in the foreground amid my roots. I'm sure the drawing is lovely. His always are. I hope it is his last of me.

...

When I see the men coming through the park with chainsaws, it doesn't ever occur to me that they could be for me. I am filled with fear as soon as they come into sight. I can see every tree in the park tense up, and sigh in relief as the men pass by them. When they near closer and closer to me, my neighbors bow in reverence. I'm one of the oldest here. I still don't really believe that they're here for me. I don't know why.

As the chain sputters to life, I'm still in disbelief.

I can make out only a few muffled words above the din as the maintenance team speaks to one another.

“Dangerous.”

“Too tall.”

“Could fall.”

The words cut me. Then one cuts me the most.

“Dying.”

They discuss which direction to off me in. I look to the horizon for someone, for anyone. Someone to save me. I hope desperately that the boy and the girl will come running over the hill, soft red blanket in hand, and chain themselves to me, begging the men to stop. To reconsider. To do anything else, anything but this.

No one comes for me.

When I hit the ground, it's not as hard as I expected. The grass softens the blow, and lifts me up off the earth. It's always looking out for me. I'll miss it, I think. I hope that it'll miss me too. Maybe they'll plant something new there, though, and it'll slowly forget about me, and look out for them instead. I would understand.

...

Maybe next, I'll be paper. I could be among the pages of the girl's next novel, or I could be the canvas on which the boy makes his next drawing. I could be their marriage certificate, or maybe the birth certificate of their first child. As I'm loaded onto the truck, and fading away slowly into black, these are the things that course through my mind. I hope they're happy. We all were happy once together. Maybe later we will all be happy together again. They know me more than anyone else—I have no identification, no one knows what I am. But I have a scar from them, the boy and the girl. I'm theirs, and that's all.







Photo by Hannah Podhorzer '19

# Wind River Range

By Lauren Franceschini

Waking up before the sun  
climbs high on the summit,  
I hike alone, down the final  
path in the dark.

This place has taken  
everything and then some;  
squeezed the nerves I need  
to walk into white-hot knife  
stabs to the hip that flared  
out with every step. Yet I stuck  
around for more.

I wear the divot in my skull  
from concussion-inducing falls  
onto boulders as a display of a  
resilience I never knew I had.  
The kind that makes me love the pain  
from that which threatened to destroy me,

because even pinpricks of blood  
that seep into the tips of my socks  
from broken toenails and busted blisters,  
like tiny rows of shining garnet and ruby,  
feel beautiful up here.

On the morning of the last day,  
I lift the last backpack  
onto my shoulders and try  
to be okay with the idea of leaving.  
Filled with peace towards  
my mountainous home,  
I have nothing left to give  
and it has nothing left to take.



# North Star State

By Joey Aveni

In a dream, I swayed alone  
in a rudderless metal scrap boat,  
puffing a cinnamon stick Swisher cigarillo.

Leaned back with my feet kicked up  
and crossed over the sharp bow,  
I drifted along a remote lake,  
bobbing like a red-eyed loon with no one in sight

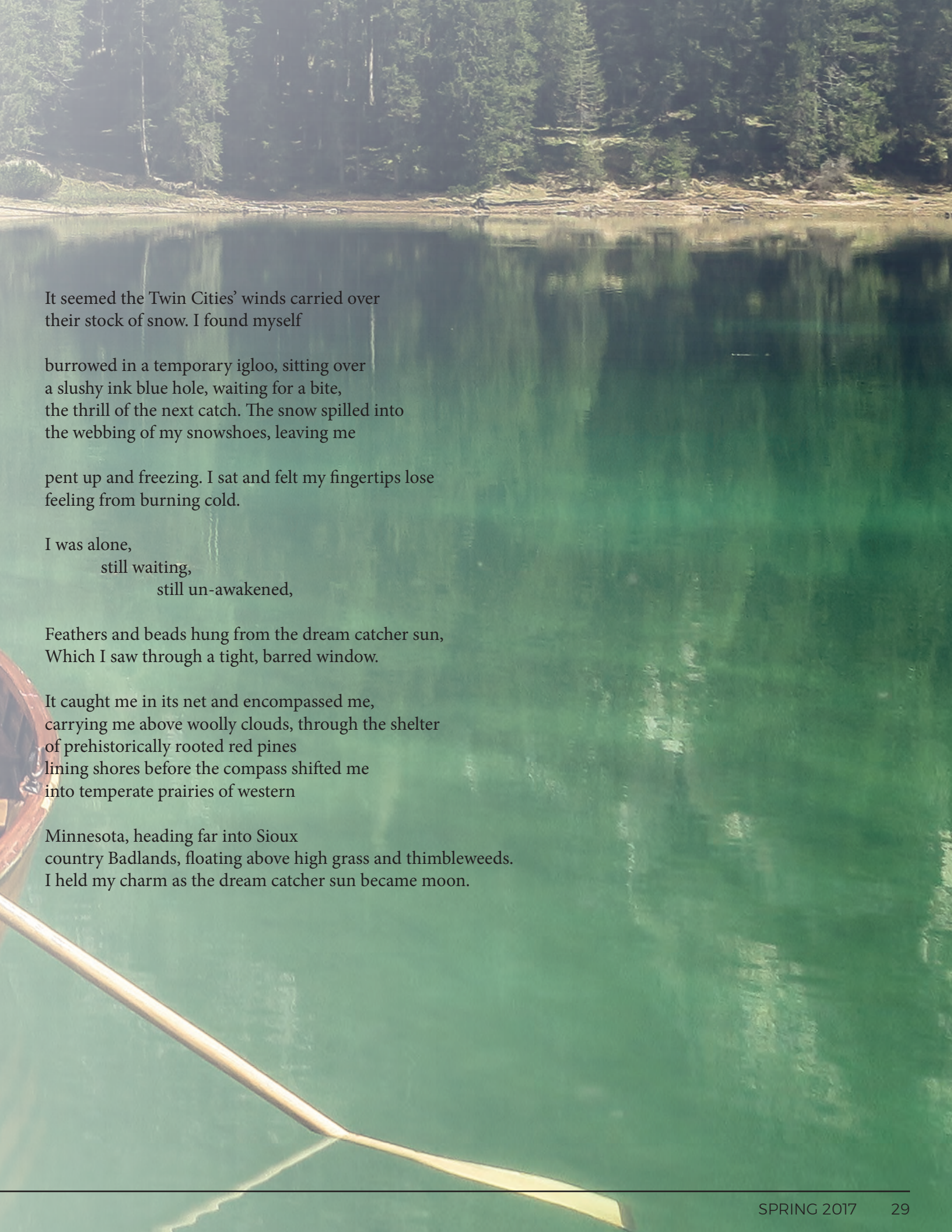
I reached over an open tri-layered tackle box,  
slivering through an icy cooler  
stocked with half-frozen Hamm's, mushy tuna sandwiches.

My lake was filled with golden-bellied trout,  
black-specked and scarlet-streaked. They fell for my rainbow  
gummy worms each time, each piece  
eventually nibbled in half with the hook spurting hot

ruby red blood through their gills.  
Retracting, gasping, fleshy and  
pink thin, bristly like jellyfish tentacles  
The oily scales ripped through my hands,  
each fish always plunging, vanishing under black water.

Calm water beneath my boat clouded up, weakened  
like cream and cold milk dropped in black  
coffee, frothing a deep  
black and tan foamed brim.





It seemed the Twin Cities' winds carried over  
their stock of snow. I found myself

burrowed in a temporary igloo, sitting over  
a slushy ink blue hole, waiting for a bite,  
the thrill of the next catch. The snow spilled into  
the webbing of my snowshoes, leaving me

pent up and freezing. I sat and felt my fingertips lose  
feeling from burning cold.

I was alone,  
    still waiting,  
        still un-awakened,

Feathers and beads hung from the dream catcher sun,  
Which I saw through a tight, barred window.

It caught me in its net and encompassed me,  
carrying me above woolly clouds, through the shelter  
of prehistorically rooted red pines  
lining shores before the compass shifted me  
into temperate prairies of western

Minnesota, heading far into Sioux  
country Badlands, floating above high grass and thimbleweeds.  
I held my charm as the dream catcher sun became moon.



# Wangari Maathai



## An Environmental and Developmental Leader for the Masses

By Chloe Donohoe

Photo from <http://www.theguardian.com/>

### INTRODUCTION

Discrepancies and misinterpretations have plagued media portrayal of African countries for generations, creating a simplified representation of the many complex cultural, social and economic structures across the African continent. Africans' assumed helplessness has led to a surge of "helpful" aid organizations and campaigns. However, these organizations and campaigns tend to merely increase dependency and reduce the agency and empowerment of African people to regain confidence in their leadership capabilities. For this reason, it is important to analyze leaders across industries and societies of African people to highlight models that have made positive changes, to challenge one's personal bias, whether conscious or not, and reverse the helpless stereotype. Wangari Maathai was one of these leaders, a Kenyan woman who influenced people and communities to take leadership to make decisions right for their communities, reversing disempowerment and environmental degradation (Grant, 2015). Through ecofeminist analysis and neocolonialism theoretical analysis of her work, this essay will examine the ways in which Maathai created space for marginalized populations in her country, giving them a voice and

developing their agency over their lives and their environment in opposition to the legacy of colonial rule. Despite the trials she faced as a Kenyan woman in a patriarchal society, Wangari Maathai was able to influence so many people because of her recognition of the agency of women and her focus on reversing the colonial legacy trapping many Africans.

### LITERATURE REVIEW

#### *Environmental Degradation*

Environmental degradation throughout Sub-Saharan Africa can be linked to colonialism. Colonists introduced non-native commercial crops, cleared forests for export-oriented agriculture, and planted exotic species of trees for the international lumber industry. These timber species were harvested but not replaced with seeds, causing Kenya to lose 90 percent of its forests in 50 years, between 1950-2000. Deforestation causes many problems for agricultural countries, leading to soil runoff and degradation of water supplies. Water scarcity in particular disrupts family units and rural community structure by forcing men to migrate to cities to look for work that they cannot find in the agricultural fields (Grant, 2015).



## *Links to Poverty and Women*

In particular, environmental degradation affects marginalized peoples in Kenya facing poverty. Those who are high in office in postcolonial Kenya illegally develop public land or ecologically fragile territories on which people depended for well-being and income, forcibly displacing poor communities from public spaces (Omaswa & Crisp, 2014; Grant, 2015). However, environmental decision making is very limited in Kenya and the interests of rural communities most affected by environmental degradation are often ignored (Muthuki, 2006).

Women facing poverty are believed to have a comprehensive understanding of what is at stake with poor management of the environment (Grant, 2015). Women in Kenya and across Africa, especially rural women, have socially constructed roles that involve them in the management of natural resources like soil, water, forests and energy, on a daily basis (Muthuki, 2006). Women understand that their relationship with the natural environment is their source of livelihood, an idea that is considered to be lost in the Global North (Grant, 2015).

## *Ecofeminism*

Ecofeminism in Kenya has been a response to the perception that women and the environment have been devalued in Western capitalist patriarchy (Muthuki, 2006). It emerged as an ideology that examines the connections between women and nature, with analyses grounded in capitalist patriarchy. Ecofeminism “advocates for development programs that emphasize people’s needs within local restraints” (Warren & Erkal, 1997). Traditionally successful components of Kenyan society, such as sustenance economy, creative organic nature and indigenous knowledge, have been replaced with “profit-focused concepts of development” that prefer men and lack recognition for women’s work. However, women play an essential role in environmental movements because they tend to be closer to nature because of their societal roles, making them more suitable for environmental management (Muthuki, 2006).

## *Disempowered Africans*

Many of the issues in African countries can be linked to the idea of “disempowered Africans” in which Africans rely on third party institutions, government institutions, aid agencies, and God to make positive changes that reflect their needs (Grant, 2005). Colonial rule and donor dependence has led to loss of self-confidence, self-respect and self-determination, causing psychological

demoralization of Africans. This disempowered syndrome can also lead to the erosion of a sense of ownership and accountability. Donor dependence, mismanagement and disempowered syndrome has resulted in Africa ranking lowest among other nations in terms of human development (Omaswa & Crisp, 2014).

## *Wangari Maathai*

Wangari Maathai was a leader of sustainable development and environmental conservation among the poor, commonly known as “Earth Mother” (Maathai & Goldman, 2005; Omaswa & Crisp, 2014). She was born in rural Kenya and lived there until she won a scholarship to attend university in the U.S., getting her degree in biological sciences and then her masters at the University of Pittsburgh (Maathai & Goldman, 2005). She was the first woman in Eastern and Central Africa to be awarded a PhD from the University of Nairobi (Maathai & Goldman, 2005). She also became the first woman to be appointed professor at the University of Nairobi and a member of Parliament, holding a deputy ministerial appointment (Grant, 2005). Maathai was the first African woman to be awarded the Nobel Peace Prize in 2004. Her academic and professional qualifications have challenged the norms of Kenyan Patriarchal society (Muthuki, 2006). Throughout her life, she campaigned on issues of poverty, malnutrition, corruption, women’s low economic status, lack of media freedom in Kenya. She also frequently criticized negative images of Africa in the Western media and the reluctance of rich countries to relieve Africa’s debts (Grant, 2005).

## *Sustainable African Development and Leadership*

Ole Danbolt Mjøs, chair of the Nobel Peace Committee, recognized Maathai for promoting an ecologically viable social, economic and cultural development in Kenya and Africa. She was known for utilizing a holistic approach to sustainable development that embraces democracy, human rights and women’s rights. Her mindset was thinking globally, while acting locally (Omaswa & Crisp, 2014).

She has advocated for an African leadership revolution, in which African reimagine community and embrace micro-nations by supporting grassroots civil societies (Grant, 2005). She feels that if indigenous Kenyan systems are supported and becoming the leading power as opposed to GMOs, then indigenous local biodiversity and sustainability will be better protected. (Muthuki, 2006). The combination of leadership with knowledge and experience creates a “powerful force for change” and combats disempowerment of Africans (Muthuki, 2006).

As an icon for sustainable development, she taught and inspired thousands of people to improve their quality of life by protecting the natural environment (Omaswa & Crisp, 2014). Her platform for inspiring so many people was her organization, Green Belt Movement, “grassroots environmental conservation and community development NGO” (Grant, 2005).

The entry point into this movement was tree planting and tree care (Grant, 2005). Maathai attended the United Nations Conference on Women and found that women from rural areas were raising land-related issues about needing firewood for energy, clean drinking water, food and income sources. She linked these issues to the need to rehabilitate the environment, an issue that was not being addressed due to improper governance (Maathai & Goldman, 2005).

In 1977, she planted 9 tree seeds in her yard. She extended her activism across Nairobi and then across Sub-Saharan Africa, persuaded women to do the same. By 2005, 30 million trees had been planted (Maathai & Goldman, 2005).

Maathai focuses specifically on the grassroots effort of reorganizing political, social, and economic aspects related to women in Kenya (Muthuki, 2006). Therefore, she started a campaign in order to obtain greater democratic space when it came to environmental issues (Maathai & Goldman, 2005). The goal was to establish public greenbelts and fuel wood plots by local people, especially women, for self-reliance, empowerment, and combating soil erosion (Muthuki, 2006). Women were able to mobilize and work together to help meet the needs of their families and communities. Thus, GBM “gave voice to the marginalized people affected by environmental degradation in the negotiation, sharing and management of resources” (Grant, 2005).

### *Model*

She used a “conciliatory approach to environmentalism by using peace activism and civic education to resolve environmental problems and for placing environmental issues at the top of the global development agenda” (Omaswa & Crisp, 2014). This movement mobilizes community consciousness while facilitating self-determination, equity, improved livelihood and security, and environmental conservation. This movement also focuses on invigorating self-confidence (Grant, 2005). Maathai promoted self-sufficiency and sought to include the un-included. GBM strengthened local communities and economies, scaling up from the very

local communities to the highest levels of society. GBM members lobbied for the new constitution of Kenya to guarantee environmental rights: “the fundamental right of all Kenyans to live in a healthy and clean environment and to have the environment protected for the benefit of future generations” (Grant, 2005). GBM advocacy activities since 1980s have included efforts to prevent forest destruction, poor governance, human rights atrocities, and corruption (Muthuki, 2006).

### *Recognition*

The Green Belt Movement has been recognized by UN Environment Programme since 1987, gaining global recognition, as well as pioneering the global environment movement at a time when there was not much awareness about these issues. She aimed to mobilize activism against Kenya’s history of domination and dispossession of its natural resources, specifically aiming to contribute to a global understanding about how disaffection and humiliations associated with environmental inequalities triggered confrontational misunderstanding, social rage and mass violence. Her work allowed for a shift in understanding that environmental protection can be the path to peace-building and resolving environmental conflict is the fundamental prerequisite for democracy and peace (Omaswa & Crisp, 2014).

## **METHODS**

Maathai’s influence as a leader in environmental justice and conservationism can be analyzed using multiple frameworks. The two that I plan to focus on are post-colonial theory and ecofeminist analysis as a means of identifying influential aspects of Maathai’s role as an environmental and developmental leader in Kenya.

One framework I plan to use is colonial legacy and the neocolonialism theory. Colonialism played an important role in the environmental degradation of regions across Africa. In Kenya, agricultural and industrial systems were transformed by the British rule to cater to outside industries rather than to benefit Kenyan industries (Grant, 2005). Conventional agriculture is essentially controlled by Western colonial powers, forcing men to find work in urban areas if agriculture could not sustain them. This affected family structures, specifically the role of women in having agency over their lives (Grant, 2005). Neocolonialism is characterized by foreign capital from “colonizing” forces serving to exploit less developed countries rather than allow for positive development, thus the gap between the rich and the poor is increased (Nkrumah, 1965). Looking at post-colonial legacy and neocolonialism will help me to analyze the works of



Maathai as responses to the destruction invoked on her people and its aftermath that is still playing out in terms of policies and social structures.

Another framework I plan to look at is ecofeminist analysis, specifically for the strategies of success that Maathai utilizes. She recognizes the agency and knowledge that women have in making environmentally positive changes for their lives and their communities. She utilizes their commitment and devotion as a means of promoting empowerment and economic prosperity for the women who have been historically degraded by systems of societal disempowerment in Kenyan society. Ecofeminist approach recognizes that the way dominators view nature is fundamentally connected to the way a male-dominated society views female values. Analyzing using this method aims to identify patterns and produce meaning and understanding as a result of evaluating these patterns (Merchant, 2012). Utilizing this approach will allow me to identify patterns of patriarchal reference and the eco-feminist approaches that Maathai utilized to reverse the patriarchal effect of environmental degradation on women and communities facing poverty.

## PRIMARY SOURCE ANALYSIS

In her Nobel Prize speech, Maathai refers to the people of Africa, the women, children and men. Her acceptance of this prize is a landmark role of a women in Kenyan Patriarchal society (Maathai, 2005). However, by addressing every member of society, she is breaking down the gendered barriers of her society, promoting equality and equitable contributions of each person in society.

Specifically, she emphasizes her mindfulness of the women and girl child, encouraging them to raise their voice and take space for leadership. She challenges the historically submissive placement of women in Kenyan society, instead asking them to embrace their

power and influence (Maathai, 2005). As the first African women to receive the Nobel Prize, Maathai became a role model for women and girls across the continent but also an indication of social change. Her encouragement for girls to follow her path and embrace opportunities for leadership is a call for the end of the restrictions help on women in patriarchal societies (Grant, 2005).

She advocates for intensifying the commitment of the government to the Kenyan people in order to

reduce conflicts, poverty, and improve quality of life. She expresses the need for the Kenyan government to embrace democratic governance in order to protect human rights and environmental rights. She challenges the dependency model entrapping so many African countries, instead exclaiming that solutions to African problems “must come from us” (Maathai, 2005). The dependency model is consequence of the colonial legacy that caused disassembly of African governmental structures during colonial rule (Grant, 2005). Therefore, many African countries are faced with corrupt rulers installed after colonizers left. Kenya’s dictator, Daniel arap Maoi, terrorized Maathai’s efforts in attempt to break down her influence. Maathai faced gender discrimination and corrupt response to efforts to make policies more equitable, a fact that she is trying to make clear to Kenyan citizens, emphasizing the need for democratic leaders at the hand of the people rather than corrupt connections (Omaswa & Crisp, 2014).

In founding her organization, Maathai was responding to the needs of women in rural areas who were experiencing the loss of the natural resources essential to supporting their families. She recognized the agency of women as the primary caretakers of both the land and their families, despite the restrictions placed on their societal roles by patriarchal structures in Kenyan society (Muthuki, 2006; Maathai, 2005). Therefore, she recognized that tree planting was a natural solution, in order develop women’s control over their lives while also remediating the effects of environmental degradation. Maathai found that this solution was simple, attainable and produced quick results, while also sustaining the

“ When the environment that women need to live and support their families is degraded, a scramble ensues for scarce goods, conflict, and injustices of the international economic arrangements. ”

interest and commitment of community members (Maathai, 2005). Maathai made the connection that meeting the needs of rural Kenyan women depended on a healthy environment, adhering to a foundational principle of ecofeminism as recognizing the connection

between women and nature (Merchant, 2012). When the environment that women need to live and support their families is degraded, a scramble ensues for scarce goods, conflict, and injustices of the international economic arrangements (Maathai, 2005).

Maathai also talks about the creation of a citizen education program, in which the people identify their problems, the causes of those problems and potential solutions (Maathai, 2005). In doing so, members are

able to gain greater awareness of their individual role in society as well as the ways in which they are connected to each other (Merchant, 2012). Maathai advocates for an independence from government assistance, instead emphasizing that “we need to hold each other accountable” (Maathai, 2005). She is recognizing that communities can work together to overcome adversities rather than fall into the dependency model reminiscent of the colonial legacy (Grant, 2005; Nkrumah, 1965).

Her experiences with nature resulted from childhood experiences and observations of nature in rural Kenya. Maathai utilized the tree as a symbol of the democratic struggle in Kenya as well as a symbol of peace and conflict resolution. Through her movement, citizens were mobilized to challenge abuses of power, corruption and environmental mismanagement. Her movement recognizes the importance of cultural biodiversity related to indigenous seeds and medicinal practices, creating space for traditionally marginalized peoples (Maathai, 2005). This part of her speech falls into ecofeminist analysis because she recognizes the agency of all members of society, rather than adhering to patriarchal hierarchies of importance (Merchant, 2012).

Her speech shifts to challenge global environmental practices, calling for immediate change. She makes the connection between healing the Earth and thus healing ourselves and the ailments that plague the social and physical aspects of our societies. She advocates for a greater level for consciousness and a determination to act on our newfound consciousness, a reality that is considerably lacking in the global society (Maathai, 2005). Maathai is bringing Kenyan environmental problems to the global level, challenging the neocolonial model of restricting developmental problems to colonized countries (Nkrumah, 1965). She instead focuses on the need to globalize efforts to end environmental degradation, recognizing the agency of all people (Grant, 2005; Merchant, 2005).

She discusses the importance of culture as playing a central role in the economic, political and social life of communities. Failure to recognize the dynamic nature of culture is an issue in current development practices in African countries, disregarding what is good and useful and instead focusing on the retrograde traditions that have been evolved from. Focusing on the positive aspects of African societies and cultures will allow for the reversal of the “disempowered African” paradigm that is hindering positive change (Maathai, 2005). Maathai challenges current approaches to development that focus on people versus nature, leading to devastated

environments and displaced peoples (Grant, 2005). Instead, she follows an eco-feminist approach as she indicates the connections of people to each other and the environment rather than living as separate forces (Merchant, 2012).

She calls for the Kenyan government to recognize the power of grassroots organizations, as they are influencing civil society to embrace not only their rights but also their responsibilities (Maathai, 2005). She challenges the idea that governmental institutions have primary influence over changes made in Kenyan society, and instead refocuses on the power of the people and their ability to make change for themselves (Muthuki, 2006). She condemns the colonially-influenced profit-based platforms of global industry that serve to support neocolonialism and challenges these institutions to ensure that economic justice, equity and ecological integrity are of primary concern (Nkrumah, 1965).

Maathai’s speech combines elements of neocolonialism theory and ecofeminist theory in order to challenge the societal structures in place that limit positive development

“Maathai utilized the tree as a symbol of peace as well as a symbol of peace





and inequitably favor some people over others. She is advocating for the people who have limited visibility in their own country to present them with opportunities to develop individually, overcoming the disempowered syndrome that has left its mark as a colonial legacy and stand up for their communities (Grant, 2005; Muthuki, 2006).

## CONCLUSION

Wangari Maathai's leadership in Kenyan political and social realms proved to transform environmental issues into opportunities for personal and community development for many Africans. Having faced issues of poverty and corrupt leadership, many Africans suffered from disempowered syndrome, a demoralized state that Maathai aimed to disrupt through her community development and environmental management initiatives in her organization, the Green Belt Movement. Having examined her Nobel Prize speech through the lens of neocolonialist theory and eco-feminist theory, I have determined that her focus on women's agency

and reversal of colonial legacies have allowed her to positively influence the people of Kenya. She has gained the dedication of many Kenyans because she gives a voice to those who have historically been relinquished of theirs. She created opportunities for Kenyans to make changes in their lives that were not dependent on aid agencies or government institutions, providing them with more agency over their lives and improving the state of empowerment among traditionally marginalized people by focusing on the solutions they can offer. Wangari Maathai has challenged the boundaries of her society in all respects, speaking to her own morals and beliefs rather than falling into the trap of depending on others to make changes one needs. She embodied democratic freedom, equality and compassion, proving to be an essential leader with holistic approaches to social change and wellbeing. Maathai will forever be the heart of Kenya and a model for environmental awareness and community development across the world. 🌍

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## AUTHOR'S NOTE

This essay was written in memory of Dr. Frontani's legacy as an incredible scholar and mentor in the field of African Development. She focused on reversing the stereotypes of African economic and community development by highlighting Effective Leaders from Across the Continent of Africa in her scholarship and public blog. Her compassion and confidence have inspired me to explore deeply and question extensively.

l of the democratic struggle in Kenya  
ce and conflict resolution. ”



Photo of Professor Wangari Maathai





# Fork to Farm Movement

Highlighting the Work of the  
Fork to Farm Movement

By Chloe Donohoe



Dan Barber, a renowned chef and writer, challenged the ideologies of the “Farm to Table” movement, calling for consideration of the whole ecological system when preparing food.

To chefs, this new way of thinking was revolutionary. The “farm to table” concept was widely spread and an important part of systemic food system transformation, but Barber argued that the current model (in 2014) would not change the food system because of its ingredient-focused singularity. Barber proposed his idea of “The Third Plate”, a form of eating that considers and utilizes the complexities of the ecological relationships of food, reflecting the work of those who cultivate it and their ecological intuition. Barber’s journey to this revelation started with flour, an ingredient so frequently used but so readily unconsidered. A trip to his local supplier, an organic farmer producing heirloom wheat for Barber’s Blue Hill restaurant in New York, revealed to him that buying one ingredient from his supplier was not sustainable because it supported only one small part of a complex network of relationships. For Barber, this changed his understanding, appreciation, and most importantly, his menu. In his book, Barber challenges all farm-to-table chefs to use their power to rebuild the connections between farm and fork, with an environmental sustainability that reflects the symbiosis and relationships in a healthy farming environment.


To farmers, especially those using sustainable organic methods, this revolutionary idea of “The Third Plate” may have seemed apparent for quite some time. A non-profit food advocacy organization known as Strolling of the Heifers has identified farmers as effective educators who are best positioned to promote agricultural literacy in communities. Barber infers this skill in his book when he describes how Klaas Martens, Barber’s grower from upstate New York, explains to him the carefully timed sequence of planting and rotating throughout the year to grow Barber’s emmer wheat. Barber’s understanding

of healthy soil and a healthy growing environment was magnified and he brought this to his customers, whose palate was newly expanded and reflective of the whole system. Without the expertise communicated from Martens to Barber, an innovative model of farm to table cooking may never have been developed.

The relationships between farmer and chef are symbiotic and equally beneficial for both parties. These valuable relationships are highly valuable for communities’ healthy food environments and are celebrated by the Fork to Farmer project, whose initiatives promotes chef-farmer collaboration in the North Carolina region. Through partnerships, the organization highlights popular farm-to-table chefs and the small farmers who supply to them through short films. They also deliver training in agri-tourism for farmers to prepare them for farm visits by restaurant clientele and others. Dr. Duarte Morais, a professor at NC State and CEO of People-First Tourism involved in the Fork to Farmer project, works closely with the chefs and farmers involved in the initiative. When asked about the importance of the relationship between farmer and restaurant, Dr. Morais talks of how his experience working with agri-tourism micro-entrepreneurs and celebrated farm to table chefs has shown him that “many chefs care deeply for the welfare of the select farmers that supply them with fresh ingredients.”

Chefs want to highlight their farmers to the public as a means of attracting people to their restaurant, but also to support their farmers in any way they can. As Dr. Morais notes, the chefs who participate in Fork to Farmer recognize that “their success depends on the viability of the farms they work with” and therefore sending their patrons to their farmers to participate in agri-tourism is dually beneficial. Patrons experience the “passion and hard work” that goes into producing the food prepared for them at their favorite restaurants. Fork to Farmer connects these two elements of the food





**“Many chefs care deeply for the welfare of the select farmers that supply them with fresh ingredients.”**

system, providing avenues for nurturing relationships of respect and appreciation between farmer and chef (Rice-Gira, 2017).

One such chef that Dr. Morais and the Fork to Farmer team work with is Chef Aaron Benjamin of Gocciolina restaurant in Durham, named Restaurant of the Year in 2015 by the News and Observer (Cox, 2015). His background working at Pop's, Rue Cler and Pizzeria Toro, esteemed Durham restaurants with regional farmer/fisherman networks, has presented him with extensive experience working with farmers. His restaurant reflects his farmer relations as well as the year he spent studying at the University of Gastronomic Sciences in northern Italy, during which he spent time in Spain, France and Croatia and was “exposed to so much beauty and different ways of cooking” than ever before. Located in an unassuming area of North Durham, his compact, trattoria-style restaurant serves authentic Italian fare with a menu inspired and reflective of the products that are seasonally available from the farms he works with.

Gocciolina sources ingredients and inspiration from both Four Leaf Farm and Green Button Farm, both of which are taking part in Dr. Duarte Morais and Chef Aaron Benjamin's Selling to Chefs Friday pre-conference bus tour. This tour is designed for farmers to help them increase production, learn about specialty products that chefs are looking for and to teach me how to facilitate relationships with restaurants. Green Button Farm and Four Leaf Farm are being highlighted in the tour because of their excellently established partnerships with Durham's most popular restaurants. Four Leaf sells to 16 restaurants in addition to Gocciolina, as well as the Durham Co-op market and Weaver Street Market. They have successfully identified and marketed to niche markets through the production of pea-shoots and kiwi fruits (Sorg, 2012).

Green Button Farm challenged the chemically and globally dominated food system that we currently favor in the United States. The philosophy of their farm focuses on the local food economy, preservation and protection of land resources and community commitment. One way they support these philosophies is through a CSA program for 22 weeks, offering seasonal produce and the option to join an eggs or meat CSA and have those included in your basket. In terms of restaurant partnership, Green Button partners with Gocciolina to provide their pork, as well as 17 other restaurants in Raleigh and Durham and South Durham Farmers' Market. Green Button owners and farmers Ryan Butler and Alicia Butler joined forces with Pitmaster Wyatt Dickson to offer farm-to-table BBQ to Durham patrons with heritage-breed pigs raised for the smokehouse. The restaurant is called Picnic and its distance from pasture to BBQ pit is only about 12 miles, enticing locavores and foodies alike (Quinn, 2016). 🦋

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# Zen Garden

By Joey Aveni



Cherry blossoms bloom,  
pink petals fall to the earth  
carried with the wind.

Raked rock ripples reach  
Kyoto, then Reseda,  
incarnating waves

and soft mossed rocks,  
seven mountains, shrine temples.  
Terraced and grooved rice

paddies, infested  
by the blood-orange dragonfly  
chasing dead spirits.

Resting on stepping  
stone islands, humming with ease,  
they always float on.

World in balance,  
but drowned out in endless noise.  
I beg for silence.

# Autumn Ocean

By Lauren Franceschini



Knees damp in shore-soaked denim,  
we stumbled along the grit  
of pebbled coastline.

Tangled by forceful salt  
sprays, like paper dolls  
condemned to frailty,  
we crashed into the sand  
and splayed ourselves wide.  
A crude star of elbows and feet  
hoping to dry out and crumble  
against the face of the sun.

Still smelling the spliff  
on our clothes, amber cider  
on our tongues, we sank deeper  
into the cool earth contented, for once,  
by the lick of waves on the shore.  
Of being still among the swell  
of pull and push.





# Contributors



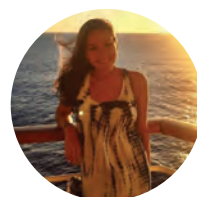
**JOEY  
AVENI '17**

is an English (creative writing) major, usually focusing his writing on the environment/sustainability despite the fact he takes really long showers. He hails from the “city of champions”, Cleveland, Ohio.



**ELSA  
DICKENSON DAVIS '19**

is an Environmental and Sustainability Studies major with minors in Creative Writing and Environmental Education. She is originally from Norwich, Vermont.



**LAUREN  
FRANCESCHINI '17**

studies Professional Writing & Rhetoric and Creative Writing. She is an amateur baker and lover of sunflowers.



**ALISSA  
PARK '17**

is studying Creative Writing with a focus in poetry. She is originally from Dallas, Texas.



**BRITTANY  
COPPLA '18**

was raised in Kinnelon, New Jersey, and is now a Creative Writing and Literature major at Elon. She hopes to become a published author and work in the publishing field following graduation.



**CHLOE  
DONOHOE '17**

is a Public Health and Environmental Studies major hoping to pursue a career fighting for food justice. She will be participating in a community health fellowship with Elon and the Alamance County Health Department.



**EMMA  
NAULT '17**

is a Biology and Environmental Studies double major hoping to pursue a career in climate change research.



**HANNAH  
SILVERS '17**

is an English major and an Economics minor. A just-west-of-Atlanta native, Hannah cooks a perfect bowl of grits every time.



