

A PHILOSOPHICAL ANALYSIS OF SIMONE DE BEAUVOIR'S EROTIC ETHIC:  
REVEALING AND PROTECTING THE EROTICISM OF THE OCEAN IN SCIENCE  
EDUCATION

by

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(Under the Direction of Deborah Tippins)

ABSTRACT

Marine science education is least emphasized in landlocked states and non-coastal areas. While landlocked states have equal right to the coast for economic and recreational purposes, they too have equal opportunity to exploit and degrade the marine environment and community. It is imperative for students to have equal access to marine science education across the United States so that youth can become ocean literate and capable of making the kind of decisions that benefit, not harm, marine and aquatic environments. In this dissertation I call for the integration and implementation of marine science education through the use of authentic inquiries. Aligned with Simone de Beauvoir's (1944, 1948, 2011) erotic ethic, I argue for a marine science education curriculum that is based on an erotic ethic. Such a curriculum would prepare and encourage students to act with erotic generosities for the ocean-Other based on their human-nature experiences and through a larger community involvement that goes beyond what are traditionally considered marine science or science education communities. This is essential if we are to consider moral

value to the ocean to establish respect and conservation measures. I use phenomenological theorizing to establish and defend the need for an erotic ethic in science education. I clarify the assumptions of Beauvoir's erotic ethic regarding women and nature as Other. I validate the need for an erotic ethic for marine science education through three arguments: the ocean as Other, marine science for everyone regardless of distance to the sea, and a phenomenology of place. I conclude with educational implications, such as the use of socioscientific issues within the classroom to explore scientific concepts while fostering ecojustice ethics and moral/ethical reasoning; service learning in the community; citizen science projects, from which the data can be used in authentic ways to tackle ecojustice issues and through which could connect students on the coast with those in landlocked states; and student-scientist partnerships. Through these methods, students will be able to gain skills and content knowledge to enhance ocean literacy and tackle ocean-related issues in their community.

**INDEX WORDS:** ocean, erotic ethic, ecojustice, environment, citizen science, socioscientific issues, student-scientist partnerships, service learning

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## DEDICATION

This dissertation is dedicated to my amazing husband and sons, who taught me the real meaning of eroticism and love.

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## TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS .....	v
CHAPTER	
1 Eroticism of the Ocean .....	1
Marine Science Education .....	6
Motivation for Marine Science in Science Education.....	12
Why Use Educational Philosophy .....	18
Educational Philosophy in Science Education.....	19
Philosophical Methodology .....	22
The Philosophy of Simone de Beauvoir .....	38
Summary .....	41
Roadmap for Dissertation .....	42
Glossary .....	45
2 Simone de Beauvoir's Erotic Ethic .....	48
Ambiguity of the Human Condition.....	50
Freedom and the Other .....	67
Violence, Responsibility, and Generosity.....	70
Limitations of Beauvoir's Erotic Ethic.....	75
Summary .....	77
3 The Erotic Other.....	79
Nature as Another Other .....	80

	The Eroticism of Woman.....	93
	Summary .....	112
4	Revealing an Erotic Ethic for Science Education .....	114
	Argument A: The Ocean as Other.....	117
	Argument B: Why Marine Science Matters for Everyone, Everywhere .	129
	Argument C: Phenomenology of Place in Science Education.....	167
	Summary .....	176
5	Educational Implications .....	179
	An Erotic Ethic for Science Education.....	180
	Developing Citizenship for Erotic Generosities .....	190
	Erotic Generosities through Service to the Community .....	197
	Projects and Activities to Stimulate Co-Evolution .....	201
	The Erotic Science Classroom .....	209
	REFERENCES.....	227

## LIST OF FIGURES

	Page
Figure 1: Rachel playing in the ocean, Long Beach Island, NJ, 1984 .....	3
Figure 2: Field work, Everglades, FL, 2004 .....	5
Figure 3: The perceptual pre-conceptual experience of a child .....	33
Figure 4: Our childhood joy can continue into adulthood .....	65
Figure 5: Elders have a responsibility to their project and the ocean-Other .....	161
Figure 6: Mothers teach generosity to Other .....	164
Figure 7: Co-evolution with the ocean-Other through authentic inquiry .....	203
Figure 8: Research cruise, Gulf of Mexico, 2004 .....	208
Figure 9: Developing an erotic relationship with the sea through field work .....	220
Figure 10: Revealing the eroticism of the ocean .....	225

## **Chapter 1: Eroticism of the Ocean**

At fifteen, I sat with my parents in a cold and impersonal surgeon's office as the doctor told us that a spinal fusion was my only option to avoid possibly paralyzing and life-threatening spinal deformity. After seeking a second opinion, we heard the same prognosis from another leading research hospital in Ohio. I had already spent years wearing a Milwaukee back brace around the clock. Doctors told me to wear the brace to fix my scoliosis, only to find out it didn't work. This news was confusing, scary, unexpected, and unwelcomed. As a child, I did not know enough to understand what they were planning to do to my body. The scientific terms used to describe the procedure in the doctor's office were not within my comprehension, and I took Doctor's words at their truth. What I did not know then, that I know now, was that my life would change forever. I would never be allowed to play on my soccer team again, where I felt part of a team and was able to exercise my body and mind. I was not able to drive a car when my friends began to do so because of the restricted movement of my fragile, healing spine. I would have to leave my classes early each day, risking ridicule from my classmates because of my disability and miss any final thoughts from teachers. The reason: if someone accidentally ran into me in the hall, my newly forming spine could break. I carried a card saying I had a metal rod in my spine for those times when I would set off airport metal detectors. Doctors told me that I might never be able to mother a biological child, never be able to carry the weight of a fetus. I cried on the couch in our family room as my mom

told me they scheduled the surgery for the day before my sixteenth birthday. In an effort to still celebrate the milestone birthday, we decided to go to the beach for a week within the months leading up to the surgery—a trip that would change my life forever. Despite feeling like a zombie, like numbness was my only refuge from confusion, fear, and anger that consumed me, the ocean became the one place where I felt safe—bodily, physically, and spiritually—to feel anything or nothing at all.

My parents had taken us to the same beach in New Jersey every summer since I was born. It was the same beach that my grandparents had taken my mother as a child, but the ocean was different that summer. It was there, during this time in my life, that I first experienced the eroticism of the ocean—the culmination of years of peripheral experiences. As a toddler I played in the sand, digging, burying, or building. My mom reminds me of how entranced I was talking to and playing with sand for hours, as if it was an old friend, but different, something growing inside of my body. As I grew, whatever issues I faced, whether it be bullying, relational aggression, development or my parents' divorce, fights with siblings or friends, a broken heart, anxiety over geometry class, or any myriad of situations I faced, nothing mattered once I walked on the beach. I found a certain peace as I walked up the path through the dunes, careful not to cross over the fence into the hills of sand protecting the rows of beachfront houses. I close my eyes and these vivid memories fill my mind. Immediately the sea air hits me. I kick off my shoes and the sand filters between my toes, sometimes scalding my feet from hours of penetrating sun exposure. The smell of the ocean is intoxicating. The seductive call of the ocean brings me down the beach to the shoreline, where there is a moving boundary between sea and land. In that moment, when my feet first hit the water, all my troubles

disappear. I don't go in right away, but rather, walk in a step at a time, letting the ocean take me, sometimes retreating a step or two before moving forward again. Other times, I run from the top of the path straight past the wave break, head first into the crashing wave, and my world is cleared as the sound of the ocean dampens any noise around me. Always I feel that whatever strategy the ocean affords to employ is the perfect method for working out my issues. Many times I am too careless with my dance, too swept up in the ocean mist, the call of the sea gull, and the smell of sea air to notice any danger. In those instances the mighty ocean reminds me of its power: a rogue wave, gripping undertow, or firm grasp of a blue crab claw—I must be respectful and cautious. If it weren't for the love I developed there, with the ocean, and the respect and care I in turn cultivated for the ocean, I could have drown many times, both on those sandy shores and in difficult moments in life. The ocean taught me various things about life and myself, but I was only beginning to know the power of the ocean, which is much more than a physical landscape that many experience when they go to the beach.



Figure 1. Rachel playing in the ocean, Long Beach Island, NJ, 1984

In the weeks leading up to my spinal fusion, a surgeon explained that part of the surgery was going to be “experimental.” The typical procedure is to remove bone marrow

from a patient's hip and fuse vertebrae. Rather than use a traditional method with me, however, the surgeon instead wanted to use *coral* as the bone graft. Going into the hospital for pre-operation instruction, I already had developed a deep appreciation for the ocean, but the surgery would make this thing I loved—the ocean—a physical part of my body. It was there during the most physically and emotionally painful moments of my life that I started to realize how influential the ocean would be forever in my life and how little I actually knew about it. Consider coral in all of its manifestations, beautiful colors, a habitat for many species, a living rock! How is it possible that a beautiful coral, that protected, fed and housed so many marine organisms, would now provide my body with the stability it needed to survive? The ocean had indeed provided this life sustenance before in many areas of my life and livelihood. Later in surgery recovery, I learned that dolphin sonar echolocation was a great therapy for my type of treatment, another idea that left me soaring with questions: I wanted to know more about the dolphin sonar echolocation and coral that had given me a second chance at life. When it came time to apply to colleges, I chose to major in Marine Science. I had a great undergraduate experience. I took field trips to the Everglades, the coasts of the Carolinas, and the Gulf of Mexico. I traveled on marine science research cruises with scientists, collected samples, processed data, and presented my research at a regional and national conference. I made the most of my bachelor's degree, but it wasn't always easy. Many of my peers in the marine science program decided to major in the marine sciences because it was an important and common part of their lives, many having grown in up coastal cities such as Charleston, Virginia Beach, and Miami. They had a clear advantage over me—I thought—already knowing so much more about the ocean than I could have dreamed, just

from spending part of my summers there. In my own life and through my research, however, I began to see how intimately connected the ocean is in all of our lives as I started to understand the relevance in my own life. Yet, through these experiences, I became inadvertently aware of the neglect of marine science education in science education, particularly in land-locked states and non-coastal areas, like where I grew up.



Figure 2. Field work, Everglades, FL, 2004

I do not live near an ocean in my daily life. I live in Athens, Georgia. I now try to recall the eroticism of the sea seeded in me. I feel the need to go back to that place of peace and take my husband and children. Some of my earliest memories are from the beach, playing in the sand, dipping my toes in the water, and catching blue crabs with my family. As I grew up and my relationship with the ‘living’ ocean changed and grew, I began to see all of nature in a new way: beautiful, powerful and worthy of nurturance. In this dissertation I will defend the central claim that the integration and emphasis of marine science curricula in science education can reveal and protect the *eroticism of the ocean*, allowing students to become aware of how intimately connected they can be to the ocean. For some students, similar to me, a relationship with the ocean may save their lives. Through the development and nurturing of an erotic relationship with the ocean,



students can become more aware and make decisions to act in a way that protects and preserves a renewed and rejuvenated relationship they may not even know about now, including prior cultural and environmental experiences that can only be protected for future generations through this knowledge and action.

In this chapter I will discuss the role that the work of Simone de Beauvoir (1944, 1948, 2011) has on my erotic ethic and how an erotic ethic lays the foundation for the philosophical work in this dissertation. I will show how Beauvoir's erotic ethic influences the philosophy of the eroticism of the ocean, which is integral in the investigation and promotion of erotic generosities in science education. Further, I will defend my philosophical methodology, position Beauvoir among other phenomenological and ecological scholars, and provide a roadmap for the course of the dissertation. First, I will consider the value of marine science education in science education. I recognize that an "erotic" ethic may be vastly misunderstood or "perverted" without a generous reading of my philosophy. However, highlighting something that is commonly misunderstood, which also leads to a better understanding of marine science within science education, is both the meaningful purpose of this work and will advance science education in many fruitful ways that have yet to be explored in pedagogy and policy. On the surface, *eroticism* has not reached the maturity within science education that it deserves, and I will come back to this point later in my in this dissertation.

### **Marine Science Education**

The ocean is vast in its expanse. It covers seventy-one percent of our planet, holding ninety-seven percent of the world's water. It is an incredible habitat, supporting nearly

fifty percent of Earth's species. The ocean provides the largest source of oxygen to our atmosphere, controls weather and climate, and contains several marine environments high in biodiversity. They are used for recreation and drive our economy. For humans the ocean provides sustenance, transportation, minerals and water, to name a few, from an almost inexhaustible list. For many, the ocean satisfies more than physical needs as loving relationships grow with each breath of sea air—I described some of these things above. Although more and more schools offer oceanography as an elective science or include it as part of earth systems courses, marine science classes are largely discounted to the traditional earth science (tangentially), biology, chemistry, and physics curriculum. Considering the significance of its impact, it is time to reconsider these priorities.

In determining how or if marine education should be included in science curricula, one might ask why it is so neglected. Perhaps the main reason is because we are not fully assimilated members of the sea community. Aldo Leopold used personal knowledge of and experience with the land, an image of what is valuable, or how we feel, to inspire the *land* ethic. It may be argued that the land ethic includes the ocean, but what is common and comfortable to us in birds and flowers allows for intellectual and emotional appreciation to blend, while the ocean remains unnoticed and unchecked. Moral value can be assigned when you think something is worthy of respect—and Leopold certainly initiated this worth. The ocean, on the other hand, is not as appreciated, even by those who embrace the environment. Ninety-five percent of the underwater world remains unexplored. What lies below the ocean surface is a world in which we cannot survive unassisted. Though more than half of the United States (NOAA, 2011) population lives within fifty miles of a coastline, few of us have an intimate connection

with the ocean and what lies beneath, often as a result of decreased value placed on spending time outdoors and increasingly busier schedules that comes with the drive to stay afloat in the economy. This refocus on economic value rather than environmental value has become more apparent as the dominant form of fishing has moved from sustenance to commercial fishing, and as family and community traditions are lost with the commercialization of fishing putting smaller family run businesses out of operation—even the local fisherperson. This disconnect is especially exaggerated in noncoastal areas, landlocked states, and among impoverished communities. Consider Tyler, a fifteen-year-old boy living in northeast Georgia, whose single mother works two jobs to support him and three siblings. Under a tight budget, Tyler's mother is often faced with choosing the cheapest protein at the grocery store in order to stretch her dollar. As a result, Tyler rarely eats seafood. However, there are some things that Tyler's mom will purchase. These things come in the form of ground up fish or fish sticks, crab cake loaded with fillers such as humectants, monosodium glutamate, enhancers, and surimi, a gelatinous fish paste made from pulverized white fish. The cheapest health and body care and cleaning products Tyler's family can afford are riddled with toxic chemicals that are detrimental to the marine environment. In other words, these chemicals, like the problems identified by scientists with urinating birth control hormones into our toilets (Waye & Trudeau, 2011), make their way downstream and affect many species of fish and other marine life. Like many of his classmates, Tyler does not spend time at the beach because his mom is busy working a schedule that constitutes the American lifestyle, especially for the middle class, and the lack of income despite all of this work keeps Tyler and his family from traveling the five or so hours to the coast. Given Tyler's situation, he not only does not

know much about the ocean, but he also does not know enough to know if or why he should care. Consider this: although all students across the United States have equal right to access the coast (and now I'm referring to places that are public, such as city beaches not owned by private individuals), students in noncoastal, landlocked, or impoverished communities have less opportunity to generate these memories or build a loving relationship with the sea, generally because of the distance or the monetary cost of travel, recreation, and time away from work spent enjoying the outdoors. This situation begs the question: If we cannot draw up an emotional connection or valuable memory for Tyler and his friends, then how can we assign moral value?

In the United States especially, the news headlines are filled with stories of environmental crises, many which are related to the ocean. For example, we are running out of fresh drinking water and much of 'our' water is trapped in saline oceans, which is too expensive to extract on a large scale. Our polar ice caps are apparently melting and sea levels continue to rise. Toxic chemicals travel through our waterways, and our bodies, endangering our lives and ecosystem health across the world. These examples are some of the things reported by journalists everyday. They are just the tip of the iceberg. Even with heightened awareness and high exposure with these stories, many people respond that their efforts to recycle, reuse materials, or reduce waste go in vein. Many of today's youth in schools think these things are meaningless. They have no hope. If you ask children what they think they can do, chances are that the answer will be one of nihilism, despair, and powerlessness, with few exceptions where students are being taught how to act in response to these environmental conditions. The idea is that one person has the potential to make a much larger impact when they act for the good of their community,

but so often the schools do not take children to the point where they will examine a range of possible choices in relation to what they are learning, take action, and reflect on that action taken as appropriate and significant pedagogical experiences. Again, there are exceptions where the constraints imposed on teachers are lessened by granting teachers more autonomy and agency, such as in many private or charter schools in Georgia where people with money send their children. Let us return to Tyler. Suppose Tyler takes a marine science class and his teachers engage him in lessons that are designed to increase “ocean literacy,” and he is enabled to take this knowledge into his community and do something. Perhaps Tyler starts a recycling program in his apartment building, so that plastic soda can rings and plastic grocery bags don’t find their way from his apartment to the ocean. On a larger scale, efforts like these could reduce the amount of trash contributing to the ever-increasing islands of ocean garbage that injure and kill marine organisms such as sea turtles, seals or birds. Suppose Tyler organizes a river clean up for the stream closest to his school, thereby creating opportunities for community networking and the promotion of a healthy river ecosystem. Concomitantly, these efforts flowing through Tyler’s community are shared with those from along the river to the sea. On the surface, recycling is one program that is often advocated through ocean literacy reforms. However, does recycling go far enough and is it what will lead to heightened global awareness and interest in marine science and science education that motivates children to act?

Many people have grown to love and respect the ocean similar to Rachel Carson, by spending time exploring, sensing, and experiencing a living, breathing surf spray as it comes off the rocks of a crashing wave and approaching tide. The ocean beckons us, and

those who spend their lives trying to get closer such as avid snorkelers and scuba divers, fishers, surfers, and researchers end up saying that they love the marine environment. But although we humans have seemingly evolved from the sea, we do not have the biological capacity, the residual memory, or intergenerational knowledge to go back to the sea and survive underwater. We are land-dwelling animals that stand on the edge of the ocean peering in with great wonder. What lies below is scary for many adults in the same way that what lies below any non-scratched surface is a place of fear, such as a fear of flying or of the dark. With exposure to and education on the sources of fear, there often becomes less to be afraid of. If we are to consider moral value to the ocean to establish respect and conservation measures, we need to establish a marine education curriculum that includes an ethic of care and erotic generosities based on human-nature experiences and through a larger community involvement that goes beyond what are traditionally considered marine science or science education communities. Educators should use marine education as a way of enhancing the lives of our students to be meaningful within the marine environment. Much of this education can focus on children and their wellbeing in relation to metaphors derived from the seas. They cannot know the marine ecosystem, and therefore how to protect it, without experiencing it. Educators can teach students not to dominate the natural world, but to carefully consider the quality of experiences that result in inhabiting various environments and how seas provide understanding for our value and the value of the resources around us. Marine ecosystems can be repositioned and defended in terms of more than holding only instrumental value or utilitarian worth (Singer and Mason, 2006); they can be useful and valuable in their own right (Regan, 1983; Taylor, 1981, 1986). To build on previous scholars' (e.g.,

Singer, 1976) arguments of rights for nature, I will briefly consider the current status of and motivation for marine science within science education, and defend whether the rights for the ocean falls within the purview of marine science education.

### **Motivation for Marine Science in Science Education**

Marine science education, or oceanography, is the multidisciplinary study of the world's oceans, seas, coastal waters, and the Great Lakes (Erie, Superior, Michigan, etc.). Researchers in the field rely on the integration of chemical, physical, geological, and biological science concepts to develop a more complete understanding of ocean systems, but such integration is not generally reflected in marine education (Lambert & Sundburg, 2006). Traditional marine education has emphasized charismatic marine organisms and ecosystem dynamics, with only slight emphasis on such aspects as natural fluxes of chemical substances, physical properties of water, plate tectonics, seafloor geology, waves, and currents (Lambert, 2006). The multidisciplinary value of marine science may provide the biggest challenge to finding a place for it in the curriculum because it does not fit neatly into the core of what is often included on standardized tests in schools (e.g. NRC, 1996; AAAS, 1993, 2009), with the exception of the restructured earth systems courses.

There are many reasons why marine science education should be included in secondary schools across the country. The National Oceanic and Atmospheric Administration (NOAA, 1998) estimates that by 2023 three-quarters of our population will live along the coast. One in six US jobs are marine-related. Earth is often referred to as the “Blue Planet,” because of the abundance of water covering the Earth, connecting

countries and cultures, affecting our health, economy, and societies—and yet we promote “being green!” in science education. People of all ages in the United States are relatively unknowledgeable about the ocean (Ocean Project, 1999, 2009), particularly when considered holistically—meaning that all components of marine science (biological, chemical, physical, geological, social, cultural) are best explained and understood when considered together. The integration and implementation of marine science education provides an opportunity for more authentic scientific inquiry experiences, and a more cohesive understanding of natural systems, along with a way to create relevant socioscientific and justice connections.

Though the *National Science Education Standards* (National Research Council [NRC], 1996) and the *Benchmarks for Science Literacy* (American Association for the Advancement of Science [AAAS], 1993, 2009) *could be* interpreted to represent marine science related content, ocean systems or marine science are not included as major themes of the national standards and benchmarks. There should be *explicit* notation regarding marine science if the ocean really mattered as much as the things that *are* prioritized as standards in school sciences. A majority of students are aware of their relationship with and impact on the ocean on some level (Lambert & Sundburg, 2006), regardless of where they live in proximity to these bodies of water, though many people do not understand the scientific processes or ecosystems that connect their families and communities with the ocean (Brody & Koch, 1989, 1990). With much of what is documented in popular media, namely tsunamis, climate change, oil spills linked to the ocean, a strong push is now being advocated for teachers to implement marine science lessons and promote ocean literacy in the classroom (Luther & Mueller, 2011), but our



educational system still lacks the resources necessary to make that happen (Lambert, 2006). The ocean's relevancy to human lives is timeless and extraordinary, though the demand for more ocean literate students has not reflected this relationship as intensely as is needed in the schools.

I want to note specifically that I am interested in the implementation of marine science within science education, not environmental education (Sanera, 2008). Environmental education was not designed to educate students, but to *indoctrinate* them into political activism (Sanera, 2008), despite the popular belief of the public. My intention is to avoid "indoctrinating" philosophies. My focus will instead be on the quality of science education. To be clear and elaborate Sanera's (2008), there are several reasons to reject environmental education. Within a *quality* science education, students should be ideally taught and encouraged to be critical thinkers, not presented biased information and trained to achieve a set end goal, as is the case in environmental education. Hudson (2001) writes, for example, "at times there have been efforts to 'dumb down' the existing scientific underpinnings of environmental knowledge as a means of advancing an agenda that depends on an unsustainable, resource-extractive approach to economic development" (p. 284). According to Sanera (1997), who reviewed several textbooks on a list of suggested environmental science textbooks, many books have inadequate science coverage, the science content included is biased and geared for a specific end goal, and the economic reasoning is generally not fairly represented. This bias of information is particularly detrimental as students are encouraged to act for an issue that has been presented as skewed, often through a crisis approach (Mueller, 2009), which I will come back to. Instead, educators ought to focus on teaching students skills

and knowledge needed to carefully analyze issues before taking actions and then reflect in some larger way on those actions (Hodson, 2011). Students should not be encouraged or guided to take action on issues for the sole benefit of the educator's agenda (which is often the case in Freireian philosophy; see Thayer-Bacon, 2000) and without careful consideration and reflection. Youth activism learned in the ways I will reject in this dissertation could actually lead to frustration and disempowerment (Connell, Fien, Lee, Sykes, & Yencken, 1999) rather than giving students a sense of competence and enthusiasm for action, which will be my goal. Environmental action has a different sense of intentionality than the biased, indoctrinating "action" prescribed in early environmental education, and which unfortunately has a residual that sticks with the environmental education scholarship today (Saylan & Blumstein, 2011). Environmental action should include authentic participation, where students investigate legitimate issues that concern them, and work through the decision-making and acting process with adults (Schusler, Krasny, Peters, & Decker, 2009), whether elders in their community, their teachers, or scientists. Also, who will be an advocate for those affected parties who do not have a voice in the decision making process? Are youth being prepared to do this? An important component of what I am advancing here is that youth work together and socially construct or re-envision what the future might look like based on their proposed solutions through cultural, environmental, and virtual heuristic considerations. If youth perceive themselves through this process of making changes in their environment for the betterment of the natural world and their community, then they are more likely to realize, understand, and work toward reaching their potential as responsible citizens. Unfortunately, I think, youth do not recognize that they are already citizens of the world.

Environmental education typically starts with a *crisis*, where the environment is doomed and in need of a savior (Sanera, 2008). Hudson (2001) refers to this tradition of environmental education as a catalog of harm, which he argues can lead to a psychology of despair, “a loss of hope for the future and the sense that we as individuals cannot make a difference” (p. 287). This behavior is typical of environmental education because environmental educators are so often professional environmentalists who have been fighting for a particular cause or causes for years and have experienced first-hand rejection, loss, or only slight progress or change (Hudson, 2001; Sanera, 2008). These “ecological crises” are often used by scholars, marketing agencies, and others to position educational and environmental reform, but have a great potential to marginalize groups of people, including women, impoverished, and aboriginal cultures (Mueller, 2009). In other words, using crisis thinking to promote environmental action could actually discourage environmental responsibility, because natural systems are discounted for the privilege of particular humans. *Ecojustice* can be used to “increase awareness around the belief that a more sustainable lifestyle is beneficial for the individual, the community, and the environment—*each in relation, as the inter-related parts of the encompassing ecosystems*” (Mueller, 2009, p. 1033, emphasis original). Ecojustice is a guiding theory for helping individuals find a balance between protecting their cultural ways of knowing (e.g., traditions) and lessening impacts on the environment (Mueller, 2009). Marine science can be taught through quality science education, rather than environmental education, if rejected, to promote ecological sustainability and conservation efforts, educate students on the affected Others (human and nonhuman), and empower students to

become involved citizen-stakeholders and advocates for evaluating socioscientific issues of ecojustice and work to revitalize the *commons*.

Commons, non-monetized natural and diverse cultural systems (Mueller, 2008) include the ocean, beaches, and freshwater aquatic systems that are free for public use. The commons also include the traditional knowledge, ceremonies, and so forth, which stem from or include the ocean and aquatic systems. Garrett Hardin spurred the idea of the commons in his 1968 article “The Tragedy of the Commons,” where he argued that people act in their own self-interest, disregarding the needs of the group. This selfish disregard of Others results in the exploitation and overuse of natural resources. Since this influential article, more educational scholars (Bowers, 2004; Martusewicz, 2005) are writing about the need for a conservation of the cultural commons for the sustainability of environmental commons for future generations and the prevention or remediation of cultural and ecological threats, risks, or what are called, *enclosures*. Enclosures are the privatization of those things that were previously considered to be part of the commons (i.e., cultural knowledge, intellectual skills, narratives, habitats, or even digital worlds) (Mueller, 2008). There are plenty of examples of ocean-related enclosures that threaten both cultural and environmental commons, including the right to own beach-front property and the allocation of property for commercial fisheries and aquaculture, both which drive out family fishing practices and local fisheries people. Through authentic marine science education, youth will learn to break down and balance the tensions or barriers of rapidly increasing enclosures and learn to protect and sustain the commons for the future.

### **Why Use Educational Philosophy?**

There is a growing research interest in science education to promote ocean literacy, including the works of Cava, Schoedinger, Strang, and Tuddenham (2005), Schoedinger, Cava, Jewell (2006), Strang, deCharron, and Schoedinger (2007) and others. One significant problem in science education, however, is that theoretical frameworks are rarely used to advance the field (Abd-El-Khalick & Ackerson, 2006), albeit they are becoming more mainstream (e.g., Mueller, 2011). Theoretical frameworks become the talk of empiricists for informing empirical studies seldom by returning to the significance of using theory work for analyzing associated data and information that provide future conversation. In other words, in science education, theory is given minor emphasis in the literature or token emphasis, according to Abd-El-Khalick and Ackerson, and other scholars. My original contribution to both Marine Science and science education is with a philosophical exploration of phenomena or entity that are discovered through personal experiences and phenomenological theorizing; how we make meaning of these experiences. With an emphasis on phenomenology as a method of philosophy, I use intense descriptions of these experiences and theoretical ones to lay bare the embedded ideologies and science education curricula choices, and strive to inform educational policy.

In the following sections I defend my use of phenomenological methodology, which differs from the way that phenomenology is used in say, educational psychology or qualitative research. Dr. Amadeo Giorgi at Saybrook University is a noted example of a researcher using psychological phenomenology research methods. I will use phenomenological theory informed by major philosophers, such as Edmund Husserl,

Martin Heidegger, Jean-Paul Sartre, and Maurice Merleau-Ponty, to do the philosophical work in this dissertation and defend a new philosophy for marine science within science education. Now, I discuss the relevance and importance of educational philosophy in science education, including examples of what philosophers in science education study. Then I move to address how to use logic to do philosophical work, paying close attention to the methods I use. Not all philosophers will agree with this methodology, and they should not, but these things are generally accepted in educational philosophy (Thayer-Bacon, 2000). Finally, I will discuss the phenomenological school of thought, and provide examples of contemporary phenomenologists who are currently doing this sort of research in science education.

### **Educational Philosophy in Science Education**

Education programs often emphasize the more scientific forms of research, teaching students qualitative and quantitative research methods in educational research courses. This situation was the case at the University of Georgia since the start of the Science Education Department program, with the exception that sometimes doctoral students analyze theory as part of their qualitative investigations—becoming much more popular in recent times. Dr. Betty St.Pierre is an example of a professor at the University of Georgia who teaches courses emphasizing poststructuralist and feminist philosophies. However, because philosophical research relies on logic and is not scientific, it has been historically discounted as a form of research in science education at the University of Georgia, and philosophy in general is deemphasized or ignored in educational research courses there. Typically there is only the mention of philosophers who informed more

empirical styles rather than a straight emphasis on how to do philosophical work in education, with few exceptions. However, unlike qualitative and quantitative research methods that argue for what *is* the case in science education, philosophical research methods argue for what *should* be the case (Thayer-Bacon & Moyer, 2006). The end goal of a philosophical argument is likewise different from that of a scientific argument and should be treated as different (Thayer-Bacon & Moyer, 2006). Whereas the “higher status” rigor for ‘scientifically-based educational research’ has been applied to more empirical methodology, philosophy is not constrained to these mandates for government endorsement or support. Unlike scientific arguments, philosophical arguments do not always use observable data to establish facts, but rather use “thick descriptions” to explore meaning and establish norms. Philosophers use tools like imagination, intuition, and emotion (Thayer-Bacon, 2000), coupled with an alliance to more humanistic disciplines such as cultural studies, literature, and the fine arts (Klaver, 2004) to reason, consider the fruitfulness of an argument, and use rational arguments to make a case for what seems to be best suited for a particular situation or situations in general. There is some disagreement within philosophy about whether theory work should inform perspectives for the particular or for all times, all places, and all people (i.e., Continental versus Contemporary Feminist Philosophy). Not all philosophers are in agreement about what should be the case ideally across time and for all people, but they can agree that philosophical arguments are not bound by ‘what is’ and are subject to assessment, challenge, and interpretation in an effort to establish norms. Many scholars in the philosophy department at the University of Georgia and elsewhere will say that philosophers seek truth, and that means truth for all times, all places and all people. Very

good philosophical arguments are the ones that have contributed something new to theory and last the test of times (e.g., Dewey, 1916). The reality is that very good philosophies are being modified all the time to do contemporary work. For example, John Dewey could have been considered a racist for the ways he talked about Native American traditions, beliefs and values; however, his theory has been modified for today (c.f., Dewey, 1916).

There are several examples of successful philosophers in science education. Michael Matthews (1994) writes about the role of philosophy in science teaching to increase science literacy and promotes cultural enrichment. He argues that philosophy in science teaching can significantly improve science pedagogy by challenging students to encourage and foster critical thinking skills, humanize the sciences, making their experiences relatable, and provide both student and teacher with a more authentic and deeper understanding of the science content. Another example is Derek Hodson (2011), who advocates for an action-oriented and issues-based curriculum by tackling the use of socioscientific issues and moral-ethical issues students often face. He argues for sociopolitical action, that is, students need to experience sociopolitical action in their science classes in order to become more responsible citizens. Michael Mueller (2009) uses philosophical research methodology to compare the curriculum in the United States to Ghana, where educational reform reflects the conservation of cultural skills and knowledge relating to community and environmental integrity. Mueller has also studied how ecojustice ethics can develop a moral-ethical character through the use of socioscientific issues in science education, with Dana Zeidler (2010), as a final example.



Philosophy analyzes what should be ideally, considering what is good, beautiful, fair, and right about something, such as science education, and defends desirable educational ends using logic and empirical evidences obtained through a large body of literature. As such, philosophical arguments are used to guide action and help us make decisions to contribute to goals and priorities, and, ultimately, work towards a more just and fair world that protects and ensures individual human and nature rights, shared culture and cultural communities, and the integrity of community and environment.

### **Philosophical Methodology**

Outlined initially by Edmund Husserl (1970), phenomenology is the study of conscious experiences from the first-hand point of view (i.e., a peeling away of the layers of self; temporality and being), or the analysis of the relationship between the perceiver and perceived. Husserl (1970) spoke of the generality of phenomenology:

This phenomenology must bring to pure expression, must *describe* in terms of their essential concepts and their governing formulae of essence, the essences which directly make themselves known in intuition, and the connections which have their roots purely in such essences. (p. 249)

The genesis of this classical phenomenology occurred with Husserl's concern with the direction of western science, where in his view, scientific deductions were altered by the prejudices of the scientists involved. He argues for a return to the analysis of phenomena in its pure state, as the things themselves, starting with how they present themselves to the immediate level of consciousness. His philosophy focuses on intentionality, how people understood a situation or experience before they began to make meaning of it, or

in other words, how the phenomena comes to our conscious awareness in the form of an intention. Giorgi (2005) describes Husserl's intentionality as the object of conscious acts transcending the act, creating openness: "Because of consciousness, we are open to the world, to others, and even to ourselves" (p. 76). Consciousness is intrinsically relational, because it is open to both unconscious acts and conscious acts, which can lead to awareness and heightened awareness of actions. Consciousness cannot exist without inherent openness to an object, which can be either abstract or concrete.

Husserl argues that one must perform a phenomenological reduction in order to get at the primordial conscious perception, or "pure" object, where he argues all genuine knowledge rests. Phenomenological reduction occurs when one peels away or 'brackets' the assumptions and presuppositions of culture, anything that can objectify it, like peeling away the layers of an onion. In doing so, all inessential details are disregarded, revealing only the immediate level of consciousness, where the phenomena or entity can 'speak for itself.' Through phenomenological reduction, we can experience the things as they are, free of prejudice and presumption, to grow in consciousness and achieve transcendence. As we are conscious of objects, we are in relation to them. We have a perception of objects as they present themselves in the world, which comes from within, but others also perceive the objects based on their own experiences, which we experience externally. Abram (1996) explains through this "associative 'empathy,'" our embodied subject becomes open to other subjectivities (p. 37). The phenomenological field is created by multiple subjectivities, including oneself. This intersubjective world, or life-world, is a key feature of phenomenology. The life-world "is the world of our immediately lived experiences, *as* we live it, prior to all our thoughts about it" (Abram, 1996, p. 40,

emphasis original). Although it is based on how we go about our daily lives, for an embodied subject, the life-world constitutes his or her natural being, the foundation of belief, social, or cultural systems that he or she ascribes to and uses to approach daily personal, worldly, and interpersonal experiences. The life-world is based on profound interpersonal experiences, and is collectively created. However, it is also “profoundly ambiguous and indeterminate” (Abram, 1996, p. 40), because how we experience a life-world is based on our situation relative to it—one reason why phenomenology has been scrutinized as egocentric (Thayer-Bacon, 2000). Nel Noddings (1984; 2003) is a good example of a phenomenologist who has been criticized extensively for the way she writes about her self without discussing ego-centrism. She uses the word “I” throughout her writings, and some have misinterpreted this use of category to mean that she is egocentric. However, the use of category is typical in phenomenological and existential philosophy, as I will later explain. Although the general notion of life-world is the same, life-worlds vary among different cultures based on how they live life on a daily basis, those unique ways of life that create their culture, and the meanings that constitute their common or respective languages. We can develop a sense of empathy for others if we are able to bodily situate our life-world in relation to other individuals, communities, and even nonhuman others that help create our common field. Keeping these things in mind and becoming aware of the criticisms of egocentrism by feminists in particular are a way to damper egocentrism.

Husserl warns that social and natural sciences, through a quest for meaning that hinders us from direct involvement with the natural world, have the capacity to remove us from the life-world. Husserl’s hope with phenomenology is not an abandonment of

science, but rather that he could use phenomenology to prove that theoretical and scientific practices are both rooted in the same primordial life-world, where our basic senses are unaided and guide our immediate everyday experiences. In other words, scientific abstractions are rooted in pre-scientific everyday life-world. Husserl refers to philosophy as the “science of essences” (1970), because objects revealed through our consciousness are not dependent on mental construction, fact, or concrete realizations (Lauer, 1965) but rather, the pure state of the object itself. For Husserl, phenomenology should demonstrate that practices within philosophy and the social and natural sciences are not used to interpret or give meaning to phenomena, because the description of an experience or object originates with the phenomena or entity. The purpose of phenomenological theory is to clarify, not explain or give meaning to, phenomena. Giorgi (2005) argues that such a clarification can provide an understanding of how we relate to the world or others, supporting constructive change, because we are better able to distinguish between what is actually occurring in our lived state and what we think is occurring. Through clarification, we are able to live more authentically, because we are able to bracket all of the inessential details to reveal the pure state of the phenomena or entity, our experiences, and our intimate relationship with (o)thers.

Martin Heidegger, Husserl’s student and assistant, altered this view of phenomenology, arguing that we are part of the world through our actions, not in spite of the world (1962). We study our actions and ourselves while considering the authentic context of our situation in and relation to the world. In other words, Heidegger’s philosophy differs from the more classical phenomenology of Husserl in that it is not focused on consciousness, but on being, or “being-in-the-world” though lived

experiences and the interpretation and creation of personal meaning through these experiences. It's not enough for the thing to present itself, because things don't always present themselves as they are. Rather, "phenomenology is seeking after a meaning which is perhaps hidden by the entity's mode of appearing" (Moran, 2000, p. 229). Heidegger's phenomenology is also more interpretive, now hermeneutical phenomenology (and hermeneutical phenomenology went into two different directions—to be clear—one for philosophy and one for qualitative empiricism. They are NOT the same thing). For philosophy, phenomenology focused on "phenomenological seeing," (Heidegger, 1972, p. 78), or a way of thinking, rather than an explicit method for studying intentionality and consciousness, which he argues is impossible due to the nature of the things themselves. Heidegger is more interested in the way that phenomenology maintains possibilities, such as in open inquiry in science education, where we might ask our students to use any combination of materials provided them to explore a situation. He explains:

The following investigation would not have been possible if the ground had not been prepared by Edmund Husserl, with whose *Logical Investigations* phenomenology first emerged. Our comments on the preliminary conception of phenomenology have shown that what is essential in it does not lie in its actuality as a philosophical movement. Higher than actuality stands possibility. We can understand phenomenology only by seizing upon it as a possibility. (Heidegger, 1962, p. 62-63)

For Heidegger, being includes how the individual experiences the physical world, but also how s/he experiences other individuals and how s/he views self as subjective and

distinct. Heidegger considers how the structures of human existence give meaning and make things possible. More specifically, in order for something “to be,” it has to manifest itself in a way that humans, through being-in-the-world, see it as such. Consider, for example, the first use of fire by early humans. A spark created by hitting rocks and rubbing sticks together became a way to bring light to an area after the sun had set. Through exposure to fire, early people found that its heat could be used to keep them warm in cooler climates and seasons, perhaps changing the way that they traveled throughout the year. Further experience with fire gave way to cooking and cleaning animals on an open flame, using fire to clear land for planting crops, and burning clay to make ceramics. Individual experiences with fire, through being-in-the-world, continue to manifest fire in different ways. Further, an essential part of human existence is the role of the being as questioner, or rather, we have a sense of our existence when it is something we are concerned about or question. Human existence is specific to an individual, and the interpretation of such “cannot be neutral, dispassionate, theoretical contemplation, but must take into account the *involvement* of the enquirer him- or herself in the undertaking” (Moran, 2000, p. 197, emphasis original). Consider how this human existence is manifested in the science classroom, for example, when students are engaged in an inquiry activity on air pollution. It is often not until the students question the materials, the process, the relevancy to their lives, and their prior knowledge that they can understand it as part of their human existence.

Being-in-the-world, for Heidegger, is reliant on interaction with the world and is the only thing that can really have ‘a world.’ Natural things, like animals, had no world, because it is an environment from which we interact and make meaning, or gain an

understanding of what we experience. The initial meaning we find in inanimate objects is in how we can use them, or through what value they have to us. Consider Heidegger's example of when we first encounter a hammer. We expect to use it as one would a hammer, not considering other possibilities for its use. It is not until we have a later intentional act toward the object, that is, the hammer, that we realize the object has value in its own right, beyond the task of hammering. For Heidegger, this method of philosophizing is the origin of science, a bracketed and pure investigation of the object as it presents itself through intentionality. This notion so often dismissed in other forms of research, hints at Heidegger's approach to hermeneutical phenomenology. Heidegger explains:

When an assertion is made, some fore-conception is always implied; but it remains for the most part inconspicuous, because language already hides in itself a developed way of conceiving. (1962, p. 199).

Accordingly, our experiences are all an interpretation, both verbally and in our relation to things. When we adopt a more "neutral" understanding of things, we enable ourselves to experience truth as revelation, rather than judgment. Here I am using the term neutral loosely. Human beings, too, have a preconceived understanding of themselves, which may not be conscious, but is usually determined by culture and whatever possibilities we hold. For example, I understand the world as a late-twenties, Irish-German-Italian, middle-class, formally educated, married, adult child of divorce, young mother, or whatever other of my possibilities you may want to consider. I cannot view the world as middle-aged, wealthy, African American, or any other impossibility for my current situation—at least not as a phenomenologist. This, however, does not mean that human

beings are alone in the world. Part of being-in-the-world is experiencing and sharing the world with others, which Heidegger (1962) describes as 'care,' and others such as Thayer-Bacon (2003a) describes as 'empathy.'

Jean-Paul Sartre (1956), however, agrees with Descartes' claim that we alone decide what is true, and we cannot experience the consciousness of someone else. Our relation to others, according to Sartre, is one of desired domination from both sides. It is possible for us to perceive ourselves as others view us, and the focus here is on Self. Like Heidegger, Sartre also has an interest in being, though his focus is on being-for-Self, or consciousness, and being-in-Self, the objects of consciousness. His phenomenology is more aligned with Husserl's than Heidegger's, but with its own twist. Consciousness, for Sartre, is about the meaning of an object, not the object itself, as if one can try to be the object, then reflecting upon the object's role in the world. The foundation of Sartre's philosophy is human perception and existential transcendence. According to Sartre, we live in a world that exists solely because individuals and collective groups of individuals make it so. According to this philosophy, science too is human-constructed (Ozman & Craver, 2011). With no restrictions or rules, only human creation, humanity is, for Sartre, truly free. With freedom, however, comes responsibility for our own actions and choices, because there is no one to blame and no justifications but for ourselves. Freedom is a MAJOR concern for existentialists, which is the frontrunner of phenomenology.

Sartre does not discredit cultural beliefs, but his philosophy on human existence supports the idea that through the human creation of injustice and destruction we must also allow for the human creation of justice, preservation, and conservation. In the same way that Sartre argues that science is the creation of man, his theory also defends that



nature is, although not human-made, given meaning through human perception (Ozman & Craver, 2011). In this way an argument can be made that humans dominate or try to control nature because of the meanings they give the natural world. Sartre also argues that just as humans try to control nature or engage in scientific investigations in order to make meaning of and give meaning to the natural world, humans ARE God. According to Sartre, God is another product of human perception and creation, and in our attempt at becoming this Self-imposed all-powerful being and by placing too large of an emphasis on God for our wellbeing, we fail to make true progress or advancements, which, Sartre argues, can only occur through goal setting and acting more fully.

Similarly, Maurice Merleau-Ponty's phenomenological view is based on perception, but in his case, more *embodied* perception over exclusive rationality (i.e., keep in mind that Sartre wrote most of his philosophy from the armchair of his desk or, interestingly, in coffee shops). Merleau-Ponty explains his 'phenomenology of origins' (as cited in Abram, 1996):

All my knowledge of the world, even my scientific knowledge, is gained from my own particular point of view, or from some experience of the world without which the symbols of science would be meaningless. The whole universe of science is built upon the world as directly experienced, and if we want to subject science itself to rigorous scrutiny and arrive at a precise assessment of its meaning and scope, we must begin by reawakening the basic experience of the world, of which science is the second-order expression...To return to things themselves is to return to that world which precedes knowledge, of which knowledge always *speaks*, and in relation to which every scientific schematization is an abstract and

derivative sign-language, as is geography in relation to the countryside in which we have learnt beforehand what a forest, a prairie or a river is. (p. 36, emphasis original)

Merleau-Ponty (1962) disagrees with Husserl's assertion that the sciences are rooted in the life-world. He argues that the world cannot be reduced to the immediate level of consciousness through phenomenological reduction, because perception is always a part of the world and all experiences within it. We cannot escape our "facticity," or our existence in the world. Human consciousness is a result of worldly things, ideas, experiences, and for Merleau-Ponty, perception is experienced bodily through worldly experiences at a prereflective level. In order for the perception to be gained, one must reflect on the experience. Reflection, however, is based on the use of language, which Merleau-Ponty argues tears us away from the unique qualities of the experience: to name something or put something into words establishes a meaning based on a representation or categorization (Ozman & Craver, 2011). In considering this point, we realize that perception is not a pure abstraction, and it does not always lead to truth. Perception, however, is the foundation of truth seeking when experienced and coupled to reflection. It is influenced by our temporal and spatial place in the world and by our intentionality, the interaction between subjects and things of the world. Merleau-Ponty began using the term "flesh" to describe this interaction. Flesh begins to get at the idea of *sensuality*.

Merleau-Ponty argues that philosophy should be used to counter objective thought that is common in modern science, which often disregards perception. A common misunderstanding of Merleau-Ponty will be conflating perception with observation, and that is not what he meant to do. He claims that scientific knowledge "cannot be closed in

on itself, that it is always an approximate knowledge, and that it consists in clarifying the pre-scientific world the analysis of which will never be finished” (1964a, p. 20). In order to get back to a reawakening or immediate engagement with the world, Merleau-Ponty (1964b) suggests a reinterpretation of Husserl’s phenomenological reduction, in which human consciousness returns to the “perceptual pre-conceptual experience of the child” (Moran, 2000, p. 402). In doing so, we can return to a level of being and way of knowing that we once had but lost through experience and age. A child, for example, begins to perceive from birth, before it is even capable of speech. At such an unadulterated stage of perception of the world, children are full of the sense of wonder at the world within which they live. They don’t immediately know the role of tools until they are demonstrated for them, nor do they have judgments for the natural world beyond what their senses reveal. Indeed, they are very sensual beings. My twenty-month-old son, for example, wakes each morning anxious to go outside and play. He loves searching for the neighbor’s cat, finding spiders in the mailbox, digging in and examining dirt, and collecting acorns and leaves. For the most part, I let him explore our yard, a nearby park, or other outdoor area uninhibited. When we are outside, he isn’t afraid to walk or climb anywhere, as he has no understanding or experience yet with such things as poison ivy, burrows, or moss-covered rocks. On a recent trip to the State Botanical Gardens of Georgia, we were walking through a pile of leaves, when he bent down to pick up something that had caught his eye—the partial carcass of a deceased metallic green Japanese beetle. He stared in awe as he turned it over and over in his hands, until finally noticing its shiny body was partially hollow, just enough that he could slip his little finger through to wear it almost like a ring. His perception of the Japanese beetle was not of a

disgusting bug, a pest, nor did he probably understand that it was once alive. His perception of the beetle was what it presented itself to be, simply, and what his senses gauged and used the sensuality of the thing before him to make mindful meaning. There was no need to understand the entity “as is,” but more importantly the phenomenon itself. If we could all become more like children, we would come closer to the idea of phenomena self. As elders revert back to their youthful understandings of the world, they too serve as an example. These things are also experienced culturally, for instance, indigenous connections with the Earth.



Figure 3. The perceptual pre-conceptual experience of a child

A key element of Merleau-Ponty’s philosophical outlook is to maintain the relation of being in world, or as he sometimes refers to as flesh of the world, in which self cannot be separated from the world. We only have one world, which presents itself to us, and which we experience primitively as a child before we are influenced by the

“distortions” of science. Further, this primitive relationship with the world is one lived within it, not as an outsider or observer of things as science promotes. In essence, the idea of objectifying, categorizing, and labeling in science has significantly gone astray from a more enlarged “nature of science”. This reduction to the primitive world of a child is really Merleau-Ponty’s call our “participation in the here-and-now, rejuvenating our sense of wonder at the fathomless things, events and powers that surround us on every hand” (Abram, 1996, p. 47). Living bodily within this world is where we find our true faith. Merleau-Ponty explains, “it is this unjustifiable certitude of a sensible world common to us that is the seat of truth within us” (1968, p. 11). Interestingly, Merleau-Ponty also discusses the truth within us when referencing our relation to the Other:

The experience of the other is always that of a replica of myself, of a response to myself. The solution must be sought in the direction of that strange filiation which makes the other forever my second, even when I refer to him to myself and sacrifice myself to him. It is in the very depths of myself that this strange articulation with the other is fashioned. The mystery of the other is nothing but the mystery of myself. A second spectator on the world can be born from me. (1973, p. 135).

Perhaps, then, under this logic, we can develop empathy for the Other, and phenomenology will likely influence an entirely different way of being in science education, including the nonhuman Other, through the adoption of the Other’s perspective when we return to the primitive world, experienced of the flesh. I will argue later in this project about the limits of “nature of science.”

There are several examples of phenomenological research methods used to analyze or describe an aspect of science education. Joldersma (2009) uses a Heideggerian framework to address how science can help us care for nature. He argues that science disclosed the planet as earth, thus revealing its fragility. Students and teachers should develop what he calls a “global imaginary,” which will make us aware of our responsibility to the earth. Preczewski, Mittler, and Tollotson (2009) use phenomenology to study how every day science interactions influence scientific literacy and meaning making among German and US students. As a final example, Hwang and Roth (2008) examine issues of learning science related to globalization and propose concepts through an encounter with the foreign/strange. They use phenomenological methods to propose ways for conceptualizing issues from the perspective of both the experiencing person and the experience itself. They use their own experiences to show how the living body can foster empathy for the strange/foreign.

My interest in exploring just some of the foundational accounts of phenomenology are to outline a similar methodology I will employ throughout this dissertation and also begin a conversation about the benefits of using phenomenology within science education, particularly to describe and interpret the significance of marine science education within science education as a larger field of education. Foremost, phenomenology reminds us to look for possibility and prophecy, or to look at the present to describe what is possible for the future. It considers how people perceive conditions and give meaning to experiences through perception, to analyze curriculum and provide future directions to guide policy internationally. Phenomenology also allows educators to understand how people are brought into consciousness, or how learners become

perceptive to possibilities, something Maxine Greene refers to as *wide-awakeness* (Greene, 1978). Greene argues for the integration of such work and activities in curriculum to promote an awareness for the quest for meaning or wide-awakeness, “to move others to elevate their lives by a ‘conscious endeavor,’ to arouse others to discover—each in his or her own terms—what it means to ‘live deliberately’” (1977, p. 120), or what Van Manen (1984) would call ‘living life deeply.’ Part of the phenomenological method, after all, is that the being “stands in the fullness of life, in the midst of the world of living relations and shared situations” (Van Manen, 1984, p. 3). Such a curriculum will encourage each student to bracket out the empirical world to reveal his or her unique primitive self, and provoke the type of reflection necessary to enable him or her to pay full attention to life. Further, a curriculum based on phenomenology may encourage students to challenge what is taken for granted (the *Status Quo*), highlight the shadows (what goes unnoticed and unchecked), examine presuppositions, and think critically about the differences in the primitive world they experience bodily compared to the world they grew into.

Beyond a phenomenological curriculum, the use and study of *ecophenomenology* would be most effective in describing the significance of the ocean in the classroom. Although phenomenology grew out of opposition to naturalism, there is a place for phenomenology in nature. Naturalism is “an understanding that everything consists of natural entities and is explained accordingly, that is in terms of laws of cause and effect” (Klaver, 2005, p. 287). To be a naturalist, however, is not limited to practice of natural laws; it includes, for example, a type of expertise in natural history. Phenomenology reveals that we are not reduced to causality, and according to Merleau-Ponty, our

embodied presences cannot be separated from the world. Klaver provides a general definition of and explanation of the importance of ecophenomenology:

By fore-grounding a background taken for granted by scientists and even by environmentalists, too, phenomenological analysis makes the supposedly self-evident aspect of things both remarkable and replete with possibilities. Environmental phenomenology can thus reorient and re-evaluate our relationships with natural entities in a way that natural science, for all its explanatory power, cannot do. Ecophenomenology is an invitation in the most literal sense of the word: it *in-vites*, brings into life, into *vita* (the Latin word for life), an engagement with the body of the world. (2005, p. 288)

As we are in relation with and in the world, we are affected by and affect all human and non-human beings we interact with. Ecophenomenology grants us the awareness of this interconnectedness, which in turn grants us openness for experiences with the natural world and the possibilities of that relationship. Through ecophenomenology, we are able to experience natural phenomena in their pure state, valuable in their own right. Further, because phenomena reveal themselves in a way that is uncovered only by human perception, ecophenomenology challenges the dominant idea of anthropocentrism (e.g. Karrow, 2010).

This link between environmental philosophy and phenomenology will provide an important connection between the work of Simone de Beauvoir's theories and the significance of the ocean. In this dissertation I will show that the erotic ethic of Simone de Beauvoir can be used to reveal the phenomena of the ocean in its pure, intrinsically valuable state, where we can regain our child-like perceptions and sense of wonder to



experience the ocean bodily and fully. I will extend her erotic ethic to create an ethic of respect and erotic generosity for the ocean.

### **The Philosophy of Simone de Beauvoir**

Very little, if anything, has been written relating the philosophy of Simone de Beauvoir to science education—despite the popularity of her philosophy within cultural studies and educational foundations. With the emerging emphasis of cultural studies of science education, there is a gap in the science education literature worth exploring. One exception is Rosser's (1998) analysis of women in science programs, in which she used Beauvoir's theory to demonstrate the societal interpretation of the body by way of biological value of the female gender and how this is found in science programs. Another is Andersson's (2010) use of Beauvoir's gender hierarchy to discuss teachers' conceptions of gender and science.

Simone de Beauvoir was born in 1908 in Paris, France. Her mother insisted that she attend the prestigious convent school, Institut Adeline Désir, where she excelled in her studies. Though she considered herself to be very religious as a child, she spent her adult life as an atheist (Bair, 1990). Beauvoir befriended Elizabeth Mabile, known as Zaza, while at this school. They remained intimate and close friends until Zaza passed away in 1929. Beauvoir credits their relationship and her friend's untimely death as the spark that led her to critique the bourgeois attitudes towards women. She passed her baccalaureate exams in mathematics and philosophy in 1925 and continued her education in philosophy at the Institut Catholique and literature at the Institut Sainte-Marie. She studied with Merleau-Ponty in secondary school and Sartre when studying for the final

examination at Sorbonne. She came in second to Sartre on the exam, becoming the youngest philosophy teacher in France (Harwood, 2010). Beauvoir and Sartre fell in love while studying for the exam in 1929. Two years later he proposed marriage, which she declined, though the two remained lifelong companions.

Beauvoir was romantically linked to both men and women. Her relationships with women were documented in some of her novels, such as *She Came to Stay*, and were responsible for her dismissal from one of her teaching positions, where she was rumored to have corrupted one of her female students. She had been previously dismissed for her critique of the position of women. In 1945 she collaborated with Merleau-Ponty, Sartre, and others to found the leftist journal *Les Temps Modernes*, of which she served as co-editor and author on some articles. Though the journal was not politically affiliated, her political commitments were questioned, inspiring the writing of her novel *The Mandarins* in 1954. A year later she wrote *Must We Burn Sade?*, which through existential philosophy considered the ethical implications of our responsibility to the other. She wrote several other novels, some considering ethical issues, such as *All Men Are Mortals* in 1946, which considered the ethics of mortality, and *America Day By Day* in 1948, which discussed social inequalities in the United States. She was a great novelist and philosopher, though she never claimed to be a philosopher per se.

She may be most noted for *The Ethics of Ambiguity* (1948) and *The Second Sex* (1949). When considered together, they reveal her erotic ethic. Beauvoir's erotic ethic essentially calls for the creation of an ethic to respect the Other's 'strangeness,' as well as an ethic of erotic generosity. The strangeness Beauvoir refers to here is what is different, unique, and possible in the Other, or what characterizes their Otherness. For

Beauvoir, generosity occurs when one intentionally gives of self for the sake of the Other (Beauvoir, 1948). It is a “state of emotional intoxication” (1953) in which “I recognize myself in the other without reducing the other to my double or dissolving myself in their otherness” (Bergoffen, 1997, p. 120). An erotic ethic is only possible when we experience the world through the flesh and is reliant on ambiguity, not identity. Like Heidegger’s phenomenology, this ethic reveals to us that the Other is not something we can control or dominate, nor is it something to fear. Ultimately, the erotic is the relationship of gifted reciprocity and generosity between self and Other, which preserves the integrity of the Other subject as it breaches it (Beauvoir, 1949).

Beauvoir’s erotic ethic provides a mirror for us to see the Otherness of ourselves. Through the ethic we can recognize that generosity is a better way to act in our relationship to the Other, rather than through violence, or subjectivity and oppression. If schools encouraged an erotic ethic within their science classrooms, the dominant view of patriarchy might dissolve, creating a place for freedom from oppression. This freedom will not only occur for individual students and science teachers, but freedom for the Other through the use of an erotic generosity. I intend to use Simone de Beauvoir’s ethics of the erotic and ambiguity to make visible the link between our lived bodies to the Other and argue that as students experience the world in the flesh they will allow the Other (e.g., ocean and inhabitants) to be free from objectification, encouraging them (youth) to act for the conservation and care of the Other.

### Summary

The genesis of this program of study comes from a personal relationship with the Ocean, where I grew in love and respect for the ocean through my flesh, experiencing the waves lap across my feet, holding blue crabs in my hands, and smelling the briny sea air as it danced across my face. Through reflection, however, I considered the disadvantages I faced not living in proximity to the ocean or learning about the bodies of water I did live near. Youth across the country face these same disadvantages, even in coastal cities, with such little support for marine science in the national science standards. These experiences have inspired me to examine what could be done to encourage teachers and educators to implement marine science curricula and how this could be done in such a way that prepared students to make the kinds of choices that will allow them to advocate for what is just or fair for the ocean Other.

The foundation of my research is aligned with the philosophy of Simone de Beauvoir (1944, 1948, 1949), more specifically her erotic ethic, though I will extend the theories influencing her erotic ethic to call for a relationship of erotic generosities between students and the ocean. Erotic generosities ask that we give of ourselves to the Other (e.g. the ocean and its inhabitants) because of the relationship. According to Beauvoir, the erotic requires an embodied subject, which lives in the flesh and blurs the boundaries between self and Other. Beauvoir asserts that to be embodied in the flesh allows us to realize that the Other's subjectivity is not something to be fearful of or oppress. Beauvoir explains that erotic freedom must come through our actions, not from elsewhere, and not because we consciously plan them. The freedom must be left open to uncertainty, with a possibility for change or for spontaneity. For Beauvoir, you should

recognize the Other as free so that the Other can be free. If they in turn recognize you as free, then freedom exists in reciprocity. Freedom ensures that the Other and self are not objectified.

In addition, Beauvoir explains that the evolution of erotic generosity occurs as one is able to participate in the world without controlling or objectifying the Other. Beauvoir emphasizes active engagement in the world through embodied eroticism in order to experience freedom and erotic generosity. I have begun to discuss why students are connected to the ocean, regardless of distance, through their bodies, each other, and the nonhuman Others involved—even metaphorically as we are all enacted through the language of our flesh (Lakoff & Johnson, 1999). I will continue this discussion throughout this dissertation and connect with other scholars to promote marine science education and encourage conversations within science education about justice and fairness for students and the marine Others for the protection of themselves and their resources and the practice of sustainability.

### **Roadmap for the Dissertation**

In this dissertation I will explore phenomenologically my own relationship with the sea and elaborate on the theories of Simone de Beauvoir to reveal an erotic ethic for marine science in science education. This roadmap is intended to guide my philosophical exploration, but is not meant to restrict the conclusions of my study. In chapter two I will outline the major tenets of Beauvoir's philosophy (1944, 1948, 2011), which include ambiguity, embodiment, freedom, responsibility, and generosity. Beauvoir explains that humans seek transcendence as they strive for their project. Our existence cannot be

defined through the desires of our project alone. We must work joyfully for our freedom and transcendence. However, Beauvoir argues that in order to achieve freedom, we have an ethical obligation to work for the freedom of the Other. In order for the Other to be free, we must view it as free. Beauvoir focuses on the flesh, because the erotic dimension is exposed as consciousness is coupled to the body. Further, the flesh blurs the boundaries between self and Other where sight alone cannot. Through embodied, erotic interaction with the Other, we enter into erotic relationships with the Other based on mutual reciprocity. As we work for the freedom of the Other, we have possibility for our own freedom, and our projects are propelled into the future. Finally, Beauvoir discusses erotic generosity, which is the intentional giving of self for Other for the sake of the Other. Erotic generosity evolves as self allows itself to be open to the world, to participate within the world without controlling or objectifying the Other. To accomplish my goals for chapter two, I will also connect with other scholars (e.g., Bergoffen, 1997; Card, 2003) who have rigorously analyzed Simone de Beauvoir's work to provide external coherence.

In chapter three I will critique Beauvoir's erotic ethic. Although her erotic ethic is valuable and certainly foundational in feminism, it is limited. Specifically, I will address her assumptions of nature and women as Other. In tackling these assumptions, I hope to clarify the category 'erotic Other.' Opening the erotic Other in this way is essential to create an erotic ethic that can promote conservation and protection of natural environments and move science education into the future.

In chapter four I will validate an erotic ethic for science education through three connecting arguments. The first argument explains the position of ocean as Other, or

ocean-Other. Because of the implications of ocean as Other, I will discuss the need for an erotic ethic for marine science in science education. My second argument addresses the need for marine science education for everyone, everywhere. Marine science education is least emphasized in landlocked states and non-coastal areas of coastal states. While people in landlocked states have equal rights to the coast for economic and recreational purposes, they too have equal opportunity to exploit and degrade the marine environment and community. It is significant for students to have equal access to marine science education across the United States so that youth can become ocean literate and capable of making the kinds of decisions that benefit, not harm, marine and aquatic environments. A marine science curriculum is also an opportunity to explore embodied generosities, because of the intimate connections between our bodies and the ocean. An erotic ethic for the ocean includes marginalized marine science knowledge, which connects students to their communities and the ocean in authentic ways. Finally, my second argument considers the value of mothers in the development of an erotic relationship with the sea. My third argument explores the idea of a phenomenology of place in science education, where students can connect erotically with the phenomena of the ocean. Returning to the phenomena allows students to make meaning in their erotic relationships with the ocean-Other that allows them to more effectively grant erotic generosities.

In my final chapter, I will draw on the premises of my theory and a sense of phenomena to consider educational implications of an erotic ethic for marine science education within science education as part of the larger educational domain. I will offer recommendations for moving forward fruitfully. To conclude I will consider some of the scrutiny that my work could potentially face and address it.

## Glossary

1. *Community* can include two general definitions, both used in this dissertation: (1) a geographical area of socially interacting people with one or more common ties (Hillery, 2005), and (2) the environment in which a group of organisms live and interact (Australian Academy of Science, 2006).
2. *Informal Science Education* is defined as science-related activities that occur outside of a formal school setting and are not associated with school curriculum or for school use (Crane, Nicholson, Chen Bitgood, 2004) and includes, but is not limited to, learning science through museum experiences, media (e.g., newspapers, books, television, Internet), social interaction with friends, family, and community (Dierking et al., 2003).
3. *Inquiry in Science Education* refers to both the ways in which scientists study the natural world and use their evidence and data to propose explanations and the activities in which students engage to learn about how scientists study the natural world and develop scientific knowledge and understanding (NRC, 1996).
4. *Marine Community* refers to a regular and characteristic association of macrofaunal species within an ocean environment (Barnes & Hughes, 1999).
5. *Ocean Literacy* is defined by Cava et al. (2005) and others as “an understanding of the ocean’s influence on you and your influence on the ocean,” where an ocean-literate person “understands the fundamental concepts about the functioning of the ocean; can communicate about the ocean in a meaningful way; and is able to make informed and responsible decisions regarding the ocean and



its resources” (p. 5). The U.S. Commission on Ocean Policy (2004) identified seven principles essential to support to definition of ocean literacy:

1. The Earth has one big ocean with many features.
2. The ocean and life in the ocean shape the features of the Earth.
3. The ocean is a major influence on weather and climate.
4. The ocean makes the Earth habitable.
5. The ocean supports a great diversity of life and ecosystems.
6. The ocean and humans are inextricably interconnected.
7. The ocean is largely unexplored. (p. 5)

The proposed definition of ocean literacy by the U.S. Commission on Ocean Policy includes some important ideas, though it falls short to adequately describe what it should really mean to be ocean literate. An ocean literate person should use knowledge of the sea to act for the resolution of specific issues relating to marine science or for the betterment of their community because of issues relating to the ocean and its resources. This knowledge does not strictly have to be from formal education and can include knowledge from one’s home, culture, community, or knowledge from some other domain. Ocean literacy should also not be pinned to certain facts or “fundamental concepts about the functioning of the ocean” (Cava et al., 2005, p. 5) in an effort to include marginalized ways of knowing and asking our students to not revert to an understanding of the ocean through the eyes of Western science.

6. *Other* historically refers to ‘lesser beings’ that are oppositional to western rationality, culture, and philosophy (Plumwood, 2002). Particularly, the Other is

counter to “the province of elite men who are above the base material sphere of daily life and are entitled to transcend it because of their greater share of Reason” (Plumwood, 2002, p. 19). Though Others have included physically and materially ‘weaker’ individuals or groups, modern rationalism views reason as the major factor for domination of the Other. The Other has included, for example, women, slaves, animals, nature, and marginalized citizens and cultures. I argue that it also includes the ocean environment and its inhabitants.

7. *Science Education* is an active process in which students learn the skills and content necessary to propose explanations of natural phenomena, test scientific explanations, and communicate scientific ideas to others (NRC, 1996).

## **Chapter 2: Simone de Beauvoir's Erotic Ethic**

The first chapter presents the role that the work of Simone de Beauvoir has on my erotic ethic, which is the cornerstone of my philosophical research about the eroticism of the ocean and the investigation and promotion of erotic generosities in science education. I discussed the need for marine science education within K-12 science education, including a look at current science curricula, which largely deemphasizes or ignores marine science in relation to earth science, biology, chemistry and physics. Even when incorporated into these subject areas, it represents a token approach to oceanography, and yet an understanding of the marine sciences is essential to living as a competent US consumer. At the same time, there is also a larger miseducation about the sea and its' inhabitants that needs to be analyzed as represented for the general public through mass media, where the integration and implementation of marine science more fully in secondary science can improve ocean literacy, allowing people to more actively participate in making more informed choices and advocate for affected parties and the ocean. I provided a rationale for using educational philosophy as a research methodology in science education, including an introduction to phenomenology, where I position Beauvoir among other phenomenological scholars. Finally, I introduced the philosophical work of Beauvoir underpinning the erotic ethic.

The aim of this chapter is to describe the erotic ethic presented by Beauvoir (1944, 1948, 2011). To accomplish this goal, I will outline Beauvoir's erotic ethic through some of the major criteria of the ethic: ambiguity, freedom, embodiment,

responsibility, and generosity. Ambiguity is central to the erotic ethic. Humans are ambiguous by nature. We are simultaneously our bodies while also not our bodies, both a subject and object, no longer part of the past or yet part of the future. However, ambiguity is not often assumed. We are gendered, molded by culture and society, and rarely living in the moment. We are painfully aware of our human situation, our mortality, and we must accept our ambiguity to achieve transcendence. Through temporality we achieve transcendence, because it enables us to recognize our volition, establish the project of our desire, determine the means to achieve the project, act for the project, and reaffirm our freedom. Freedom, for Beauvoir, is the ultimate justification for determining the meaning in our existence. Throughout Beauvoir's work, she focuses on relationships, generally between self and *Other*. She uses the Other in reference to the female or feminized side of the relationship, the side that represents the characteristics rejected by the traditional male counterpart: passive, weak, in need of protection, silent, and inferior. Beauvoir discusses the "flesh," first used by Merleau-Ponty (1962), to explain how we embody the ambiguous subject such that self and Other become indistinguishable. Simply put, *embodiment* is our living body and grasp on the world and project. A final essential characteristic of the erotic ethic, which can be found as sexually embodied beings affirm ambiguity in self and Other, is *generosity*. Generosity is essentially to seek the freedom and happiness of the Other, rather than dominating or enslaving the Other. I will discuss these points in more depth using Beauvoir's major themes: the ambiguity of the human condition, freedom, and the Other. At the conclusion of this chapter, Simone de Beauvoir's erotic ethic should be clearly outlined, providing an opportunity to examine the limitations of her theory in Chapter 3.

## **Ambiguity of the Human Condition**

### *The Situation*

Simone de Beauvoir wrote *The Ethics of Ambiguity* (1948) following the Nazi invasion of France between 1940 and 1944, an event which caused her personal hardship and triggered in her a conversion of sorts. She no longer believed her own happiness should stand at the forefront of her consciousness; taking a stand against oppression became more important in the face of the evils of the world. Although Beauvoir had been examining various angles of injustice for some time, namely freedom, oppression, and responsibility, her experiences during the Nazi invasion led her to consider the question of violence and the Other in *The Ethics of Ambiguity*. Considering the scene in Paris at the time, Beauvoir seriously questioned violence with respect to what she referred to as the tragic condition of the human situation, in which our freedom, driven by a spontaneous internal force, is crushed by external causes out of our control. Faced with the weight of the world, Beauvoir thought it was not enough to focus solely on one's own happiness and pleasure—we must take a stand. She argues that in order to live ethically through erotic generosity and consider reciprocity and ethical responsibility we have to each other, we must assume our ambiguity.

Before we can discuss her view on eroticism or what it means to live ethically, it is important to understand the human situation. Beauvoir describes the human situation as a “tragic ambivalence” humans face: we are aware that as we live, we are preparing for death—something, of course, that plants and animals also undergo, but we rationalize. She explains of man: “at every moment he can grasp the non-temporal truth of his

existence” (p. 7). All humans have felt their own mortality, though most try to mask it in a mind/matter dualism. This dualism establishes a hierarchy of body and soul in an effort to eliminate ambiguity by either succumbing to the sensible world or escaping it. Beauvoir explained that the “more widespread their mastery of the world, the more they find themselves crushed by uncontrollable forces” (p. 9). Humans experience themselves as a pure intentionality and as a thing crushed by uncontrollable external forces; as neither part of the past or of the future, in a place of nothing; as alone, yet also a part of a larger collectivity. Beauvoir uses the atomic bomb as an example: scientists were knowledgeable enough in chemistry to create it, yet its purpose was destruction for humans. There are innumerable examples of this mastery gone awry in present times: chemicals created to make “better” cleaning products that are toxic endocrine disruptors in humans and other animals; growth hormones used to increase the size of our livestock detrimentally change the dynamic of human body chemistry; genetically modified organisms created to benefit our well-being in a variety of arenas have a whole host of negative ramifications for natural biological processes (e.g., Curieux-Belfond, Vandelac, Caron, & Séralini, 2009; Dona & Arvanitoyannis, 2009). This idea extends beyond primarily crushing human lives and health, affecting even larger society. Take, for example, the mastery of physics, which led to the invention of the light bulb. With the first light bulb came a desire for light bulbs in every home and office. More affluent people could afford them and the impoverished people wanted them. A demand for light bulbs increased, increasing the supply, and eventually they became more commonplace. The light bulb extended the amount of light available per day for work and chores, creating an expectation for many to stay awake longer in order to accomplish more

during a single twenty-four hour period. Many parts of the world are still lacking the resources that allow for widespread use of the light bulb, putting these people or cultural groups at an, often extreme, economic disadvantage. In nations with regular light bulb use, people are sleeping less now than ever before, contributing to obesity and mental health issues, among other problems. This example is but one of what comprises our situation. As a result of this condition, each person feels larger than life while also feeling as small as an insect within the collectivity of the human race.

Beauvoir's work in *The Second Sex* shows her understanding that our *facticity* shape our character development. Facticity is aspects of our situation that we are born into, like our body or where we are from. Because we cannot choose the aspects of our facticity, they have the possibility to limit our freedom. Beauvoir takes the same position as Heidegger, Sartre, and Merleau-Ponty—"that if the body is not a *thing*, it is a situation: it is our grasp on the world and the outline for our projects" (Beauvoir, 2011, p. 46). Our situation, then, is how we experience the world, and our body is merely an expression of those experiences. She describes in depth the differences between the male and female body, and how these biological differences mold the character of both sexes, regardless of cultural, historical, and societal influences. She notes, however, that the latter, which comprises the lived experience, situate the different sexes such that the biological differences may not matter depending on how the sexes are situated within society. For example, certain cultural groups in central Africa and parts of the Middle East practice female genital mutilation, in which a woman's external genital organs are partially or totally removed during infancy or childhood in order to decrease libido, typically to ensure pre-marital virginity and monogamy during marriage. In these cultures

the biological function and sexual distinction of the genitals are disregarded for the sake of cultural beliefs and norms.

Beauvoir explains that certain aspects of our situation can limit our freedom to act. In general, Beauvoir argues that social institutions limit the freedom of men and women alike, though in different ways and degrees, including, for example, the historical owning of African Americans as slaves, women's suffrage, and more recently the legalization and societal acceptance of gay marriage. What Beauvoir takes up in *The Second Sex* is that historically, culturally, socially, economically and so on, women are more limited in their freedom to act than in the case of most men. She compares this disadvantage of women to the inequality of African-Americans to white Americans and Jews to Christians, though she acknowledges that there are numerous other aspects to the human situation that limit our freedom to act. She also argues that during certain times in our life, for example, we are more limited than when we are in our "best" years. Though our situation may shape our character, it is not determining. The aspects of our human situation provide us with possibility and opportunity. In *The Ethic of Ambiguity* Beauvoir explains that despite the human condition, man (as in humankind generally) can still choose to live ethically:

In spite of so many stubborn lies, at every moment, at every opportunity, the truth comes to light, the truth of life and death, of my solitude and my bond with the world, of my freedom and my servitude, of the insignificance and the sovereign importance of each man and all men. There was Stalingrad and there was Buchenwald, and neither of the two wipes out the other. Since we do not succeed in fleeing it, let us therefore try to look the truth in the face. Let us try to assume



our fundamental ambiguity. It is in the knowledge of the genuine conditions of our life that we must draw our strength to live and our reason for acting. (1948, p. 9)

According to Beauvoir, all optimistic ethics begin by acknowledging the failure involved in the condition of man. Moral action can only occur for a being that can reflect and question himself in his being. Beauvoir further notes that justice cannot occur in the face of injustice. Evil originates in situations of oppression, in which individual action is powerless. In other words, we must work against oppression in order to achieve justice. As we assume our ambiguity, we have the capacity, the strength, the value to act morally, grant freedom to the Other, and achieve transcendence.

### *The Other*

Before going any further, it is important to give meaning to the Other, though this will continue to develop over the course of my dissertation. Generally, the *Other* is that which is not self, does not usually share the same characteristics, and is therefore less favored than self and those more similar. Most often for Beauvoir, the Other represents the feminized other, which is associated with those qualities typically associated with women in a patriarchal society, in which women are viewed as inferior to men in most regards, such as through weakness and voicelessness. The Other is characterized by having less possibility and often begins at birth based on the familial background. For example, Beauvoir discusses African Americans and Jews as Others, though she most notably takes up women as the Other. When perceived as *lesser*, Others are more vulnerable to objectification and oppression.

### *Ambiguity*

The erotic ethic cannot be defended without explaining the significance of ambiguity. “The erotic experience is one that most poignantly reveals to human beings their ambiguous condition; they experience it as flesh and as spirit, as the other and as the subject” (Beauvoir, 2011, p. 416). This idea of existing as both a being who is a conscious, choosing subject, while simultaneously an object subject to facticity and the perception of self and Other is central to Beauvoir’s ambiguity. Simply put, to embrace this ambiguity and exist as both subject and object is the ethical way to live, to shoulder responsibility for humanity and grant freedom to self and Other. According to Beauvoir, to deny this ambiguity is to reject ethical responsibilities and be devoid of basic human compassion.

Ambiguity can be further explained through our desires of intentionality, which Beauvoir describes in *The Ethic of Ambiguity* as two intentional moments: the moment of disclosing the meaning of being and the moment of making meaning in the world. Though initially the moments of intentionality appear to contest each other, they are together reflected in the ambiguity of the human condition. Central to Beauvoir’s understanding of the human condition is that to be human is to be a failed thing. If we understand that we are flawed, our existence cannot be defined through the object of our desire, particularly *bad faith* projects, or those that lead to self-deception. Rather, the truth of our being is established through the act of desiring and the failure to become what we desire to be. We are saved from falling into bad faith when we understand that we can never become our desire. The idea is that you don’t make failure your goal, rather

you aim to struggle against it. As such, you do not actually fail to successfully obtain your desire, because your desire is by definition unobtainable. Understanding this, you can endure your desire in continuity. Consider, for example, the desires associated with hurt and anger toward another that disrespects or crosses you. If you are driving and someone carelessly and dangerously cuts you off, you may have a desire to inflict harm on the offender, drive erratically, or make some other threat to his or her freedom. For Beauvoir, you would fall into bad faith by acting on these desires. When you are able to struggle against your desires of road rage, the desires become unobtainable, and the truth of your being is revealed.

To assume our ambiguity, the failure of man must also be surmounted. To better understand this point, we must consider the position of Sartre, because it is in reaction to his work in *Being and Nothingness* (1956) that Beauvoir makes this claim. According to Sartre, we are ambiguous as a “lack of being” so that being is possible. As men are aware of their human condition, including our “lack of being,” we strive for something unobtainable, being for-ourselves and in-ourselves. Through this attempt, we find failure. Sartre argues that passion is chosen; it does not come from external influence. Passion is useless for this purpose, as it does not assist in becoming the being you are not. To provide a simple example, if your passion in life is to become a world-famous chef, simply having passion is not enough for Sartre. You must study, perfect your craft, work hard, and persevere. Likewise, someone else can’t tell you what to be passionate about; that has to come from within. Though Beauvoir is often regarded as heavily influenced by Sartre, particularly because of the nature of their relationship professionally and personally, her stance here is less extreme. For Beauvoir, it is essential to be more

practical and less pessimistic. It is in the revealing and making of meaning that we find success. Our failure is not necessarily a negative thing, because to even attempt means we have choices. We can still make meaning and values for our existence through our failure. Beauvoir explains a festival, where festival-goers dance, sing, play, and drink. Eventually the drunkenness wears off, the joy subsides, and people realize they have less money with nothing to show for it. The point of the festival is to allow men to feel absolute, but the feeling of absoluteness as the end goal is unobtainable, because it means their project is achieved and they are fulfilled. Ambiguity, an essential for transcendence, falls apart without the experiences associated with living for the project. The festival does not help man achieve an absolute existence, because one must actually work for that. It cannot be expected that this end will be achieved through an evening or two of public celebration. An absolute existence is still what we desire, and seeing this absolute as a means of fulfillment only further emphasizes that we are born to die. However, if we can surmount our failures and face the paradox of our human condition, Beauvoir remarks that we “also discover that every moment toward death is life...this the present must die so that it may live” (1948, p. 127). Fulfillment can then be achieved through this intention if we can desire our experiences absolutely. Beauvoir writes that “this means that man, in his vain attempt to *be* God, makes himself exist *as* man, and if he is satisfied with this existence, he coincides exactly with himself” (p. 12-13). Extending beyond Sartre’s view that there is “negativity” in the lack, Beauvoir argues that we should just “deny the lack as lack” and affirm ourselves a “positive existence” (p. 13), thus transforming the noncoincidence, which we are originally, into an exact self-coincidence, an existence of self-fulfillment and joy. This notion is exemplified in Beauvoir’s discussion on freedom,

in which we desire the freedom of Others to increase their possibilities. We find joy and pleasure in the perpetual pursuit of our desire for freedom of the Other.

Surmounting the failure of man isn't necessarily that easy. Beauvoir explains that reliance on an absolute, such as God, can prevent the possibility of failure when considering the connection between this reliance on an absolute and our freedom and transcendence:

When a man projects into an ideal heaven that impossible synthesis of the for-itself and the in-itself that is called God, it is because he wishes the regard of his existing Being to change his existence into being; but if he agrees not to be in order to exist genuinely, he will abandon the dream of an inhuman objectivity. He will understand that it is not a matter of being right in the eyes of a God, but of being right in his own eyes. (p. 14)

Beauvoir is arguing that belief in a higher power beyond oneself can prevent us from assuming the ambiguity of our human condition, because we put our faith into something else to create an existence. Our blind faith in a higher power to do His, Her, or Their will allows us, as followers of this absolute, to find truth in our being as is, even finding satisfaction in our lot in life, rather than to strive to reach that which we desire. For Beauvoir, we can only improve our situation and be free if we have intention for our project that can never be satisfied, because the project will never be fulfilled. Belief in an absolute makes this impossible, because our passions ultimately come from without for the sake of the higher power. We must only examine and work for our own passions and projects in order to change find meaning in our existence.

According to Beauvoir, religious affiliation is a major obstacle for assuming our ambiguity considering that a large percentage of the human population believes in an absolute higher power of some kind. Claudia Card (2003) also explains that the culture and philosophical beliefs of Anglo-America also presents this roadblock. The term ‘ambiguity’ often refers to something flawed that is subject to ridicule or criticism. It is vague and unclear, so is generally considered a negative thing or something that needs to be fixed or changed in some way to bring clarity. Card asserts that the Anglo-American tradition makes ambiguity undesirable because of this negative connotation, but it also makes responsibility easy to relinquish. For Beauvoir, ambiguity is ethical and reminds us to take our responsibilities seriously. The issue of clarity in ambiguity is not to be considered a negative thing. It simply requires us to make our own meaning and values in life rather than to go with the *Status Quo*.

### *The Project*

In order to achieve transcendence, we must understand that human passions create that which is desired. It is our project, that which we ultimately desire, that establishes an end. With that understanding, we create what is valuable and how it should be judged. The project is something to be desired throughout the extent of a being’s existence. Though smaller ‘projects’ are enacted, they should act as means to persevere toward the ultimate project. In other words, each limited end establishes a stepping-stone to move forward toward the ultimate project in which we are engaged. Sartre explains this ongoing project as a “nihilating” nonconscious in nonstop flight from past to future. Beauvoir, again attempting to steer away from Sartre’s negativity toward joy, explains these limited

projects as points of departure that reveal a creative freedom of which “the creator leans upon anterior creations in order to create the possibility of new creations. His present project embraces the past and places confidence in the freedom to come” (1948, p. 28). Freedom is confirmed through each creation made at each limited end. Beauvoir is clear that man does not create the world, he merely reveals that which the world allows him to reveal. According to Beauvoir, outside of existence, there is nobody or nothing. The question then is not whether man exists or whether his existence is purposeful, but rather whether and how he wants to live. God doesn’t make judgments and grant favors; man bears the sole responsibility of the world. Beauvoir explains, “It is up to man to make it important to be a man, and he alone can feel his success or failure” (p. 16).

In *Pyrrhus et Cinéas* (1944), Beauvoir elaborates on the idea of dependence on the Other for the sake of our project. Though each individual has his own project, these projects can only be actualized when existing for the Other, because we need the Other to recognize and validate our project as meaningful. Further, there is an alliance between those who mutually recognize the human condition, and as such, whose projects coincide or benefit in some way. She echoes this in *Must We Burn Sade?* (1953) when she explains that people are naturally connected when they experience transcendence together through a shared common project.

On the other hand, Beauvoir argues that we cannot interact with the Other without attempting to achieve some level of control over the Other, because we are ultimately searching for validation through them, often resulting in a power struggle. She explains, “It is necessary to me that the Other project me towards a future that I recognize as my own; I am checked decisively if my action achieves significance by virtue of becoming

useful to my enemies” (1944, p. 106). Because of this, if a project leads to oppression, the social institution guiding the project makes it difficult for us to exercise social justice because of the political inequalities established within the regime. For example, we can consider the disadvantage of an employee working under oppressive conditions. Initially the work project may seem pure, so all employees, at various levels, may desire the same end and work for the same goal. As the manager seeks to gain validation for her work, she creates an oppressive environment by taking advantage of her authority, essentially throwing her weight around and abusing her power. However, as manager, she creates an inequality that would be difficult to overcome, further oppressing her employees. Thus, it is imperative that we align with free Others who recognize the meaning of our project to work toward freedom and liberation. Revolutionary values arise not from the individual man but from the collective group joining together in revolt and hope with the same end in sight. “An ethics of ambiguity will be one which will refuse to deny *a priori* that separate existants can, at the same time, be bound to each other, that their individual freedoms can forge laws valid for all” (p. 18).

### *Freedom*

One may betray the project and work in opposition, but there must always be granted the freedom for that betrayal in order for the actions to hold real meaning. Freedom is essential to the erotic ethic, as to be ambiguous is to be both free and dependent, an agent of action and part of the collective. For Beauvoir, “freedom is the source from which all significations and all values spring. It is the original condition of all justifications of existence. The man who seeks to justify his life must want freedom



itself absolutely and above everything else” (p. 24). As an existentialist, Beauvoir believed that human existence has no set values or predetermined meanings, so we must use our freedom to make meaning and establish values. Man is also obligated to continually embrace his responsibility, which Beauvoir admits can be very confusing (1948, p. 39), perhaps creating anxiety and fear. Man is responsible because he “bears the responsibility for a world which is not the work of a strange power, but of himself, where his defeats are inscribed, and his victories as well” (p. 16). To explain, we have certain responsibilities because we have the ability to make or reveal meaning in the world, but more importantly, it is our choice to do so. Our successes and failures are ethical consequences of our choice to take on our responsibilities of embracing our freedom and revealing or creating meaning. If we choose to act against or not to embrace our freedom, then we fail to make meaning, and the world suffers the consequences. Beauvoir is very clear on this: pursuing actively can result in freedom while inaction can result in oppression. For Beauvoir, it is the same decision to will oneself moral as to will oneself free. When man is unwilling to face or accept his freedom, he is acting in bad faith. He can also be acting in bad faith when he refuses to accept the freedom of the Other. In *Pyrrhus et Cinéus* (1944), Beauvoir describes our acceptance of freedom inasmuch as the foundation of the relationship to the Other. Of this Beauvoir says, “As a not-thing, I am a spontaneity that loves, wants, and acts. I am, in a word, a transcendence” (1944, p. 11). Freedom, then, must not trap being, but disclose it, whereby being transitions to existence. When we deny our freedom, we fail to fulfill our existence. Part of being responsible for oneself is to accept our freedom, work against bad faith, and acknowledge that we create our own values.

Freedom is sought through the goal of the project, which is infinite in scope. Though we may still strive for more limited ends, they must be justified by acting for the unity of the larger project. In other words, we may approach the provisional end by carrying out an action that works as a stepping-stone toward our overarching project of freedom of existence. Engaging freedom as our goal shifts a focus to ethical freedom, where constant engagement affirms our existence and allows us to happily create meaning as we strive for our project. For Beauvoir, our failure at not becoming what we desire to become is a source of heartbreak and joy: “heartbreak, because the project is then robbed of its particularity—it sacrifices its flesh and blood. But in joy, since at the moment one releases his hold, he again finds his hands free and ready to stretch out toward a new future” (1948, p. 30). Though we will never reach our end goal, we should find joy and happiness through our intention for the project and in finding creative freedom at each provisional end.

Beauvoir posits that each individual is fundamentally capable of freedom, though situations can make it difficult to achieve freedom. Freedom is situated through historical and social context and the impulses of embodiment of the individual. For example, in *The Second Sex* Beauvoir discusses how women fall into bad faith by not accepting their freedom, but this is a byproduct of our patriarchal society. In a patriarchal society many women are led to believe that they are happier as the Other, rejecting their freedom and denying their responsibilities. Others are situated in such deep oppression that they are unaware of the possibility of their liberation. Women are in bad faith if they at any point realize the potential of their freedom and responsibility and do not accept it. One example Beauvoir discusses in *The Second Sex* is motherhood. Though a woman has the necessary

physiological and biological components to create, carry, nurse, and care for a child, she does not have to. A woman should be free to choose this for her own life or not. However, when she is socialized to believe that her only worth is through the quality or quantity of her brood, she may spend the prime of her life pregnant or nursing her children without questioning this life. If a woman in this situation were to realize that she had other options, such as birth control, abortion, or adoption, and desired another way than her predetermined life but did not strive to achieve it, she would fall into bad faith. This would, of course, be true for anyone facing oppression. In order to avoid bad faith, we embrace our freedom and accept our responsibilities. Part of our responsibility is to help to liberate those that cannot liberate themselves, whether it is because they lack the knowledge or the means. It is important to note here that despite our best intentions for the Other, we cannot act for the Other. For Beauvoir, the failure to be able to act for the Other requires morally that we act with them.

Children are also situated such that their freedom is impacted. Beauvoir links bad faith to childhood, which poses a different situation in which the end justifies the mean for the justice of the future. According to Beauvoir, children are situated in the world of the Other. As such, the child finds that he or she has a place in the world, where he or she is dominated by the situation. They are born into their situation with little say for how they fit. Because the child is not yet ready for the responsibilities of the adult world, he or she does not contest the domination of the situation. Children experience a sort of situated freedom, in which they are not responsible for the situation, but they can learn freedom through the values of the situation. As children transition from the world of the Other to the adult world, Beauvoir argues that they put the childish world behind them

and take responsibility for their new world and their choices. This situated dominance is validated through the transition of responsibility and to ethical freedom as an adult. Beauvoir argues that not everything has to be left behind in childhood, however. The joy we experience as children can extend throughout adolescence and adulthood, allowing us to live joyfully for our project.



Figure 4. Our childhood joy can continue into adulthood

If there are Others who are oppressed despite being fundamentally capable of freedom, it is necessary for man to not only embrace his own freedom but to want and work for the freedom of the Other, such that his project has relevance and value. This benefits the individual man and his collective by validating the meaning of his existence, and it benefits the Other, whomever that may be, by granting them freedom from objectification. To recognize self and Other's ambiguity and grant freedom to each is the foundation of Beauvoir's notion of reciprocity. Freedom, then, is relational. As mentioned previously, to deny the Other's freedom is to act in bad faith. When man denies the Other of their freedom, he oppresses them by putting his own freedom above

theirs and ignoring their ability to make meaning, thereby seeing the Other only as an object and self as powerful and controlling. Beauvoir (1948) explains that recognizing the Other's freedom expresses joy of existence:

However, it must not be forgotten that there is a concrete bond between freedom and existence; to will man free...is to will the disclosure of being in the joy of existence; in order for the idea of liberation to have a concrete meaning, the joy of existence must be asserted...at every instant; the movement toward freedom assumes its real, flesh and blood figure in the world by thickening into pleasure, into happiness. (p. 135)

Beyond needing to grant the Other freedom simply to recognize the meaning and value of our project, we must grant the freedom of the Other so that the goals of our project can extend into the future. An important component of viewing the other as free is the notion that the ends justify the means. For Beauvoir we are obligated as ethical beings to work for the justice of the future so as to acknowledge the value of people in the present. She explains:

However great the quantity of men sacrificed today, the quantity that will profit by their sacrifice is infinitely greater; on the other hand, in the face of the positivity of the future, the present is only the negative which must be eliminated as such: it retrieves itself only by transcending itself toward the permanence of future being; it is only as an instrument, as a means, it is only by its efficacy with regard to the coming of the future that the present is validly realized... (1948, p.117).

This idea has stood the test of time, as with every war waged a seemingly innumerable amount of people are killed, as citizens and on the field, in order to protect countries, values, cultures. With every battle, we are thankful to those lives lost so that we can be free. Beauvoir is merely explaining that those lives are not lost in vain, because they are providing something more than we could ever receive without their service. This idea is true regardless of the project so long as it strives for freedom of self and Other.

### **Freedom and the Other**

#### *Eroticism through Embodiment*

An erotic ethic requires an embodied subject, rather than a physical subject. For Beauvoir, the erotic dimension is exposed as consciousness is coupled to the body. As embodied beings, we are passionate and thoughtful. We are influenced by the push and pull between the natural world and society, and we make choices based on these influences. We act upon decisions based on our passions and our emotions through our bodies. Ambiguity of the body is inseparably linked to the ambiguity of the human situation, as the body expresses that which the situation is engaged in. Embodied subjects are part of situations that they do not create, though they are responsible for them and how they behave within them. In other words, political, cultural, and societal influences situate freedom, where oppressive institutions make it difficult to recognize each other's freedom.

In *The Ethics of Ambiguity*, our desires are described as that of an individual situated in the world and interacting with others. Beauvoir moves beyond this notion in *The Second Sex* to identify how desires are influenced by sex and our social, political and

cultural situation. She asserts that subjective embodiment is always sexed and gendered. Patriarchal society has perverted our relationships by sexing our desires, dissociating us from our ambiguous self. In other words, Beauvoir claims that we strive for transcendence as a woman or a man, accepting our role as, respectively, oppressed or dominant based on the confines of patriarchal society. However, it is important to note when considering an erotic ambiguity that, for Beauvoir, sex is not reliant on biological or genital functions (1973), because embodied people have erotic intentionalities. She explains sex as:

an intentionality that the body experiences, lives through, an intentionality that exists in the relation to other bodies and that conforms to the general rhythm of life. It takes form in relation to a world which it provides with an erotic dimension. (p. 472).

Consciousness should be analyzed in an erotically perceiving body to determine how activities are sexed within a nested situation or how it is influenced by erotic desires. In an erotic relationship, we are able to assume the ambiguity of self and Other equally, thus desiring freedom for both in reciprocity. In *The Second Sex* Beauvoir explains:

The asymmetry of male and female eroticism creates insoluble problems as long as there is a battle of the sexes; they can easily be settled when a woman feels both desire and respect in a man; if he covets her in her flesh while recognizing her freedom, she recovers her essentialness at the moment she becomes object, she remains free in the submission to which she consents...The words “receive” and “give” exchange meanings, joy is gratitude, pleasure is tenderness. In a concrete and sexual form the reciprocal recognition of the self and the other is

accomplished in the keenest consciousness of the other and the self. Some women say they feel the masculine sex organ in themselves as a part of their own body; some men think they *are* the woman they penetrate; these expressions are obviously inaccurate; the dimension of the *other* remains; but the fact is that alterity no longer has a hostile character; this consciousness of the union of the bodies in their separation is what makes the sexual act so moving; it is all the more overwhelming that the two beings who together passionately negate and affirm their limits are fellow creates and yet are different...What is necessary for such harmony are not technical refinements but rather, on the basis of an immediate erotic attraction, a reciprocal generosity of body and soul. (p. 415)

In other words, part of the pleasure of eros is experiencing the ambiguous embodiment of the Other. To be clear, for Beauvoir an ambiguous sexually embodied subject is not the same as a physical and gendered fleshed subject. The magnitude of our flesh can be found in our sexual embodiment; we can't escape that. A sexually embodied self is able to live in the flesh, but the flesh is not the only way to encounter the erotic Other. The erotic provides openness to the Other through the flesh. What is erotic about sexual acts, then, is the expression and acceptance of ambiguity in both self and Other. The openness of the flesh grants the opportunity and responsibility for moral valuation of the Other, providing a need and a place for generosity. Through our erotic ambiguity we can engage meaningfully with Others and set the stage for joy.

A major tenet of Beauvoir's erotic ethic is that flesh cannot be possessed. In being objectified, for example, as a beautiful body, you are vulnerable to possession. Patriarchy is linked to the gendered flesh, where through patriarchy it is acceptable for men to



become oppressors of the Other, whether it be of women or other men, and women are given to men as flesh. From this linkage the erotic experience is capable of breaking through the perverted context of eroticism in patriarchy. Eroticism is separated from the perversions of patriarchy when man experiences a failure to possess the flesh. As long as flesh is desired for possession, and as long as it is allowed to be objectified, it is impossible to establish a relationship with the Other. As Beauvoir refers to it in *The Ethics of Ambiguity*, it is in the drama of the flesh that we can recognize the futility of acquiring being through possession. Beauvoir argues in *The Second Sex* that the flesh be considered ambiguous. Once the body is ambiguous, it is erotic and subjective, not violent. It can escape patriarchal identities and alienation. As ambiguous, the subject no longer views the flesh as a downfall to objectivity. The flesh becomes a gift that, when offered, transcends intentionality.

### **Violence, Responsibility, and Generosity**

To act in violence is to negate the consciousness of the Other, to treat them as pure Other. Recall that the intention of granting freedom of the Other is so that they can recognize and subsequently give meaning to our own projects. If we negate their projects through violence, we are reducing the Other to a pure object, incapable of granting validation or recognition. Men view their failure at becoming God as satisfied through domination or ownership. Beauvoir (2011) explains this perceived compensation:

Man dreams of an Other not only to possess her but also to be validated by her; to be validated by men who are his peers entails constant tension on his part; that is why he wants an outside view conferring absolute value on

his life, on his undertakings, on himself. God's gaze is hidden, foreign, disquieting: even in periods of faith, only a few mystics felt its intensity. This divine role often devolved on the woman. Close to the man, dominated by him, she does not post values that are foreign to him: and yet, as she is other, she does remain exterior to the world of men and can thus grasp it objectively. (p. 200)

Under patriarchy, the desire of women to be a woman falls to bad faith, as women of patriarchal societies are often viewed as passive and inessential Other, vulnerable to oppression. In many patriarchal societies, women are not free to discover the possibilities of their ambiguity. In others, they understand their inequality, and while some women struggle against bad faith, as in *Women's Suffrage*, others do nothing, resulting in bad faith. Despite the existence of patriarchal societies, humans are obligated as ethical beings to recognize the Other, therefore we must reject projects or desires that will negate or harm the Other's freedom. In *The Ethics of Ambiguity*, Beauvoir explains that we are always transcended by the Other's desires and project. She continues in *Pyrrhus et Cinéus* that as we have an agenda for our project and desire, we align ourselves with those Others who have the same or similar agendas that can benefit ours or try to convince those in opposition to essentially alter their freedom to recognize and accept our project. Those that are indifferent or wish to change the project to suit their agenda become an enemy we must contend with. It is here that we see violence is unavoidable. Attempting to do away with oppressive regimes and conditions requires an act of violence. In *The Ethics of Ambiguity* Beauvoir explains that because violence is unavoidable, we are faced with the choosing between degrees of violence. We must pick

the lesser degree; our goal should be to do less violence than what we are working against.

Because a relationship with the Other for the project or desire, the trajectory of the project is at the hands of the Other. We can only appeal to the Other to align with our project. Beauvoir identifies conditions for the possibility of the appeal: health, knowledge, leisure, and freedom. If any of these conditions can be in any way rejected or negated, they are to be opposed. In the case that someone is indifferent to your project, you can appeal to him or her. In the case that someone is opposed to your project or wants to drastically change it, Beauvoir argues it can be acceptable to act in violence. In turning the Other from a subject to an object, the Other is vulnerable to violence. That is, if someone rejects the conditions of the appeal (and you ought to appeal to them first), it is justified to reduce them to an object to protect your freedom. According to Beauvoir, this reduction is permitted because you are not being violent against their lived subjectivity, but rather their facticity. Through violence, however, you can prevent the opposing person from threatening your subjectivity or freedom. Transcendence, according to Beauvoir, is realized through erotic risk. It is important, however, to remember that transcendence is the risk, not the violence. Violence is merely a type of risk.

In *The Second Sex* Beauvoir explains that to consider transcendence as violence allows the Other to become an inessential Other. Both self and Other, then, should be free to exercise violence to obtain transcendence. Barring the Other from the domain of violence is an act of domination. In other words, you must consider violence to preserve your own freedom but also to ensure choice, thereby granting freedom, for the Other.

However, through *Pyrrhus et Cinéus* Beauvoir further justifies the notion of responsibility, in which each person is responsible for themselves. She explains that because we cannot act for the Other, we also cannot be responsible for them. As a result, the meaning that I create becomes part of the way the world is experienced or how the Other is situated in the world. Beauvoir challenges us to “treat the other...as a freedom so that his end may be freedom” (Beauvoir, 1948, p. 142). As we grant freedom, the Other has the choice of assuming their ambiguity and accepting that freedom, thereby gaining their own responsibilities. Her concept of responsibility challenges us to use this constituted meaning to enhance the world so that the Other has increasing possibilities (Beauvoir, 1944), which includes liberating those who do not know how or that they can rebel.

Returning to the idea that embodiment is always sexed and gendered, Beauvoir explains in *The Second Sex* that the result is a complication of patriarchy of the ability of consciousness to liberate. Her concern is not in whether a myth or image of woman endures, but rather how these things influence the embodied consciousness of woman. For example, how do women view themselves and each other because of the dominance of patriarchy? Patriarchy has sculpted the identity and character of women through a perversion of desire that hinders her possibility and opportunity for reciprocity. In order to do away with the gendered bad faith roles patriarchy assigns, men and women must accept the ambiguity of their condition.

Part of Beauvoir’s theory of ambiguity is to use generosity to try to understand the situation of the Other. Generosity is necessary to keep us from objectifying the Other and evolves as man allows himself to be open to the world, to participate within the world

while acknowledging freedom of self and Other. As previously discussed, Beauvoir explained that we need to seek freedom and happiness of the Other so that our own projects are recognized and extend beyond our lifetime. Without this recognition from the Other, we run the risk of “hardening in the absurdity of facticity” (1948, p. 71). In other words, without recognition for our efforts from the Other, we are doomed to a limited freedom based on our facticity. For example, Jane is born with a heart condition to an impoverished family. Her heart condition and the socioeconomic status of her family are part of her facticity, because they are both aspects of her life that she did not choose and have the potential to limit her freedom. Beauvoir argues that if Jane does not seek freedom of the Other, who then in turn recognizes her efforts, she is doomed to an impoverished life and if medical advances were able to cure her condition, Jane would be unlikely to receive treatment. Through this commitment to the Other’s freedom for the sake of our own, we form a generous relationship. Beauvoir explains that generosity is “more valid the less distinction there is between the other and ourself and the more we fulfill ourself in taking the other as an end” (1948, p. 144). She further explains in *Pyrrhus et Cinéus* that if you gift your generosity, you are allowing the Other to see the ‘Otherness’ of your own freedom. In *The Second Sex* Beauvoir argues that through this committed relationship and the generosity that grows through it, reciprocity is created. If each individual can take advantage of this reciprocal relationship—this generosity—then there is a possibility of “universal freedom” and escape from oppression. In reciprocity and erotic generosity, we recognize the freedom and facticity in the Other and can find love:

It is only as something strange, forbidden, as something free that the other is revealed as an other. And to love him genuinely is to love him in his otherness and in that freedom by which he escapes. Love is then the renunciation of possession. (Beauvoir, 1948, p. 67)

Beauvoir explains in *The Second Sex* that if through reciprocity we act generously with gifts, we are erotically allowing transcendence (i.e., freedom) of the Other, the ultimate goal of our project.

### **Limitations of Beauvoir's Erotic Ethic**

In her erotic ethic, Beauvoir offers a refreshingly positive perspective for achieving transcendence and granting freedom of self and Other. In addition to her optimism, her ethic advantageously requires a relational ambiguity and erotic generosity for transcendence of self and Other. She carefully discusses the relationship between sex and gender, and explains that an erotic relationship does not have to consist of a sexual relationship. Her ethic is defensible, and yet there are some limitations of Beauvoir's erotic ethic, particularly for my use in science education. Of the possibilities, in chapter 3, I will take on her assumptions of nature/ocean and women as Other, amending and extending her theory for marine science in science education. I will introduce them briefly below.

#### *Nature/Ocean as Other*

In *The Second Sex* (2011) Beauvoir speaks of the 'heterosexual' relationship exclusively with respect to the erotic ethic. In a heterosexual marriage the man and woman, both bringing their own Otherness, share in the generosity of the gift for the sake of their union and their passions to acknowledge the Other's ambiguity and grant freedom to the Other. However, because the possession and use of sexual organs is only one way to experience the erotic Other, we can assume that a heterosexual marriage is only one example of Otherness. Although this idea provides an opportunity to discuss a whole host of possibilities, in chapter 3, I will focus on how the erotic ethic extends beyond a human-human to a human-nature relationship, specifically with respect to the *ocean* as Other. This is particularly important, because in Beauvoir's attempt to achieve equality for women, she unintentionally positions nature as Other.

### *Women as Other*

Beauvoir argues that women are limited in their abilities to accept and make full use of their freedom, especially compared to men, because they are subject to menstrual cycles, pregnancies, and nursing. Women are therefore burdened by their bodies, because the aspects of their fertility mentioned above keep them from truly experiencing freedom of choice. This comes, in part, from the necessity to keep timely, often monotonous schedules to ensure the proper upbringing of children. Beauvoir considered motherhood for these reasons as equivalent to selling oneself into slavery, and that in order to experience motherhood while still maintaining some sense of freedom, women should always artificially inseminate and, when possible, use a surrogate. While in current US society women are granted a certain degree of choice for their fertility, namely birth

control, legalized abortion, adoption, there still remains varying degrees of social stigma associated with each. Through these choices, motherhood makes appearances of a merely logical decision. I argue that motherhood actually defies logic, as it is so deeply relational, personal, and passionate. Through the mothering experience, women innately have a need to assume their ambiguity and are required to shoulder responsibility such that Others are free. Through motherhood, women act in reciprocity and erotic generosity to find love and offer freedom to their child(ren). I also argue that motherhood should not be linked solely to the female form. To be clear, I claim that men experience ‘motherhood’, not paternally, but through the erotic relationship that forms between him and his children in much the same way women do. Finally, I address Beauvoir’s stance on menopausal women. She argues that menopausal women are limited in their freedom, because they are no longer able to reproduce. Men view them as no longer valuable, and women no longer have meaningful projects to strive for. I argue that the worth of menopausal and postmenopausal women is not based on their ability to reproduce. This is particularly evident as more and more menopausal women make choices to care for their bodies despite the changes they face, and many choose motherhood despite their reproductive capabilities.

### **Summary**

In this chapter, I outlined the major tenets of Simone de Beauvoir’s erotic ethic and defended her theory, including specifically her theories on ambiguity, the human condition, the project, embodiment, freedom, and generosity. Finally, I discussed a few limitations to Beauvoir’s erotic ethic, which I will take up in Chapter 3. We are reminded



that according to Beauvoir's ethic, once one becomes aware of the possibility of liberation, one ought to act. Though the ocean is not capable of understanding its own possibilities as rational thinkers do, we can and are aware of the domination of the ocean through our patriarchal society, which is why we ought to be stewards for the ocean. Beauvoir acknowledges that there are no definitive answers and that we are beings subject to facticity and situations out of our control. Her erotic ethic therefore does not focus on who is to blame, or what is specifically right or wrong, but rather that we work harder to become more responsible, compassionate, ethically acting people.

### Chapter 3: The Erotic Other

We are ambiguous by nature. We are also gendered and a product of history, our culture and society. Though we are very much aware of the mortality of our human situation, and strive in many ways to escape ambiguity for the purpose of establishing a mind/body dualism (and avoid vague or negative connotations), Beauvoir argues that we can achieve transcendence if we assume our ambiguity. Through ambiguity, we have the wherewithal and strength to live ethically and morally. We gain wisdom from understanding and striving for the project to accept freedom and responsibility of self and desire freedom of Other(s). We acknowledge, when applicable, the need to release the shackles of oppression. As sexually embodied beings, we are able to use generosity to grant freedom to Other(s), engage in meaningful relationships, and find joy and love in self and Other(s).

Faced with the bleakness of the human condition, it would be quite easy to regard this quest for transcendence with nihilism and despair. Beauvoir's erotic ethic, however, is optimistic. Rather than place blame, her ethic acknowledges the road blocks in our path and challenges us to press forward with joy and hope. This sort of attitude is necessary to make positive strides in science education, as I will later defend. The major criteria of her erotic ethic are invaluable for progressing marine science education and other trends in science education, and provide a platform for my work.

Although Beauvoir's erotic ethic certainly is foundational in feminism and offers important lessons for ethical living, her legacy is limited. There are two major areas I will

address in order to ensure that the erotic ethic can be used more fruitfully in education. First, Beauvoir is most noted for her discussions on women (2011) and the elderly (1996) as Other, but her work lacks application for environmental categories without further analysis. Beauvoir also discusses the limitation of freedom and oppression women experience through motherhood and menopause. She can be misinterpreted for placing too heavy emphasis on the value of women based on her ability to reproduce. In this chapter I will tackle these assumptions in order to clarify the category of the 'erotic Other.'

### **Nature as Another Other**

*He knows that he was conceived like the cattle and the harvests, and he wants his clan to conceive other humans who will perpetuate it in the perpetuating the fertility of the fields; nature as a whole seems like a mother to him; the earth is woman, and the woman is inhabited by the same obscure forces as the earth.*  
(Beauvoir, 2011, p. 78)

### *Woman Versus Nature*

In *The Second Sex* (2011) Beauvoir describes women as more enslaved by their biology for the sake of the species than men. She argues that from the initiation of puberty, a woman's body is not her own. Her breasts are never for her own personal health; her ovaries and uterus, in her monthly cycle, prepare to support another life and as a result are more prone to throw her body into disarray than maintain equilibrium. When a new life is not implanted, her body sheds blood and tissue to prepare for the next cycle. For

many women, ovulation is accompanied with bloating, cramping, and body and head aches. Through pregnancy, her body sacrifices shape, essential vitamins and minerals, and energy to support a growing life. After pregnancy and painful, sometimes dangerous childbirth, a woman's body may take several months or years to recover, though never fully, and not including the time she spends breastfeeding her child. It can be argued that these shackles are bound even earlier as a female infant is born with every egg in her ovaries she will ever have. A male creates sperm almost daily once his testes reach maturity. Although a woman may not spend a majority of her life actively pregnant or rearing children, her body works for the sake of her fertility for a larger percentage of her life than a man does.

It can be argued, according to Beauvoir, that women, creating life from within, are more aligned with nature than men. Men, on the other hand, are more aligned with culture, as they spend a majority of their lives creating outside of themselves. Beauvoir explains that this is central to her argument that women are more prey to the species:

Here we hold the key to the whole mystery. On a biological level, a species maintains itself only by re-creating itself; but this creation is nothing but a repetition of the same Life in different forms. By transcending Life through Existence, man guarantees the repetition of Life; by this surpassing, he creates values that deny any value to pure repetition. With an animal, the gratuitousness and variety of male activities are useless because no project is involved; what it does is worthless when it is not serving the species; but in serving the species, the human male shapes the face of the earth, creates new instruments, invests and forges the future. Positioning himself as sovereign, he encounters the complicity

of woman herself: because she herself is also an existent, because transcendence also inhabits her and her project is not repetition but surpassing herself toward another future; she finds the confirmation of masculine claims in the core of her being. She participates with men in festivals that celebrate the success and victories of males. Her misfortune is to have been biologically destined to repeat Life, while in her own eyes Life in itself does not provide her reasons for being, and these reasons are more important than life itself' (2011, p. 74).

What Beauvoir claims is that women accept that they are assigned this lot in life—to perpetuate life solely through childbearing and supporting the men who perpetuate life through cultural and economic advancements. In accepting the cultural situation, women fall subject to *immanence*, the organic or animal, a stagnation, passivity, or immersion in nature or the cycle of life. Men, on the other hand, are able to surpass this immanence to achieve freedom and self-determination, or *transcendence*. Beauvoir argues that man makes woman his Other by taking away her autonomy and valuing her solely on her reproductive capabilities, making transcendence for women virtually impossible. When women accept the cultural climate of men, as Beauvoir suggests they do, they participate by perpetuating the social and cultural situation of women. Through this participation, they position themselves in an intermediary place between culture and nature, not quite able to create culture on their own, but still deeply entwined with nature. Beauvoir questions then how women can gain emancipation and achieve transcendence. Through her analysis of women, she finds that in order to be recognized as having the same rights as men, women must transcend their biology. In doing so, women can find the freedom and self-determination necessary to make personal choices for self outside the realm of

the reproductive body, choices that include, among others, her place socially and politically and the possibilities of her employment.

Considering that, according to Beauvoir, a woman can only gain the same political and social status as men by denying and transcending their sex, it can be argued that Beauvoir sees the female body as something separate from herself, an “enemy”—an Other. Maria Mies (1993) agrees, explaining that Beauvoir doesn’t even question a hierarchical divide between mind and the female body in order to achieve freedom and self-determination. “She wants to be like man, like the master, and sees no other possibility but to establish dominance of the head (master) within the female body (slave)” (p. 226). Further, Beauvoir argues against the woman/nature comparison. In a conversation with Alice Schwarzer (1984), Beauvoir makes clear her opinion on women being likened to nature: “Equating ecology with feminism is something that irritates me. They are not automatically one and the same thing at all” (p. 103). As she recognizes the historical linkage between nature and woman, she argues that nature essentially aides in the Othering of women, in the biological processes of the female form and in how men perceive the woman’s place in their lives. Beauvoir explains that men thank nature for the happy accident that is “women”, different from the purposeful, rightful lives they lead as “men.” So strong were her convictions to end the oppression of women, Beauvoir turns *nature into an Other*, seeking to alienate women from nature. Throughout the span of her work, Beauvoir very rarely writes about nature or environmental associations beyond how it tethers women to the life of a second-class citizen. For Beauvoir, in order to break free, women must join the ranks of men in the domination of nature. She describes the complicated, often destructive, relationship men have with nature:

Man seeks the Other in woman as Nature and as his peer. But Nature inspires ambivalent feelings in man, as has been seen. He exploits it, but it crushes him; he is born from and he dies in it; it is the source of his being and the kingdom he bends to his will; it is a material envelope in which the soul is held prisoner, and it is the supreme reality; it is contingency and Idea, finitude and totality; it is that which opposes Spirit and himself. Both ally and enemy, it appears as the dark chaos from which life springs forth, as this very life, and as the beyond it reaches for: woman embodies nature as Mother, Spouse, and Idea; these figures are sometimes confounded and sometimes in opposition, and each has a double face. (2011, p. 163)

Man understands that from his birth, “murderous Nature has a grip on him” (p. 165). However, man also considers himself a fallen god, wanting desperately to be God but limited by his facticity. He dominates the earth in his entitlement and greed, but also out of fear of the flesh, which reminds him of nature going back to his birth.

Beauvoir understands that men are free through the subjugation of women, maintaining women as Other. This relationship promotes a paradigm that object cannot exist without subject, which Beauvoir logically concludes as the escape route for women: in order for women to also achieve transcendence and gain freedom, they must establish their own Other. In Beauvoir’s case, nature is the Other for women. In an effort to free women, Beauvoir has established an *anthropocentric* ethic of eroticism. The anthropocentric viewpoint is human-centered, fundamentally based on the idea that only humans have intrinsic value and all other natural beings are merely means to a human-desired end.

*The Influence of Root Metaphors and Consequences of Rationalism*

The relationship of woman versus nature as favored by Beauvoir runs so deep that some feminists are anxious for women to act for the sake of nature in order to dispel any oppressive affiliations. Mary Mellor (1997) cautions, however, “the case for reconnecting with nature must...be a good one if all the gains of (some middle class, white) women are not to be lost” (p. 195). As Beauvoir asserts, man (generally) positions self above nature in the quest for transcendence, but this Othering of nature is not the solution. The case for reconnecting women with nature *is* good, because it concerns the ethical value of nature. A disregard for the value of nature is embedded in our society through the unconscious use of root metaphors and rationalist culture, which distance man from nature and which promotes the domination of nature, particularly in western thinking. Exploring and understanding root metaphors and reason/emotion dualism may reveal a new path for transcendence by challenging Beauvoir’s erotic ethic. Taking this route may compel women to act for the sake of nature without the fear of losing any grounds they have gained through independence and the women’s movement. Will men see nature and women as separate entities, neither lesser than himself, and both valuable in their own right?

Our culture and society are framed by metaphorical concepts (Lakoff & Johnson, 1980). As youth are socialized into society, the structure of their thinking is influenced by root metaphors, including, for example, patriarchy, individualism, progress, and anthropocentrism (Bowers, 1993). “[R]oot metaphors are the basis of interpretive frameworks that were constituted in the distant past, and that continue to reproduce in



today's thinking the misconceptions of these earlier times" (Bowers, 2008a, p. 304). Patriarchy, for example, can be traced back to the early Christians and is still a strong influence on modern society. These root metaphors are at the basis of western thinking, encoded in our daily language and regulating industrialism/capitalism, often at an unconscious level. Root metaphors are embedded in our language.

Patriarchy is an example of a root metaphor that has over centuries characterized the behavior and identity of women as restrictive and passive and now frames how people think and act toward women (Bowers, 2008b). Patriarchal societies promote male privilege, in which the oppression of women is a major component (Johnson, 1997). Huey-li Li (2007) argues that this results "in order to ensure men's continuous independence from the mother and the female in general, it becomes essential for patriarchal culture to define the wife's role as submissive and inferior" (p. 353). This explanation echoes Beauvoir's reference to men wanting to dominate nature because of his fear of the flesh, which reminds him of the obligation of his relationship to nature through his birth. This root metaphor extends in society through male identification, in which what is considered desirable or good is linked to the masculine and men (Johnson, 1997). Consider the use of gender specific pronouns, where masculine pronouns are used in reference to, for example, the strong, dominant, and preferable, and female pronouns are used in reference to the weak, inferior, and second-rate. In many patriarchal societies nature is gendered female. This is evidenced by the use of such terms as 'Mother Nature,' 'Mother Earth,' or a 'virgin' environment, untouched by man.

Although the idea of nature as female may not be negative for many people (e.g., mother as comforting, protecting, nurturing), this assumption still limits possibilities of

how nature will be perceived. Carolyn Merchant (2006) describes how influential the female metaphor has become for nature, arguing that when nature is gendered feminine, it creates a passive nature easily dominated by science, technology, and capitalist production. Merchant makes an example of Francis Bacon during the transition to early modern capitalism, when he supported using science and technology to extract the secrets of nature from her “bosom.” In doing so, man would use the secrets for the improvement of the human condition (Merchant, 1980). Merchant explains that the use of the ‘nature-as-woman metaphor’ historically protected nature from destruction, while the use of the metaphor where woman is ‘disorderly’ became more common during the scientific revolution. Bacon often referred to the disorderly woman when designing scientific methods, though “as a whole, the Baconian doctrine of domination over nature is correlated with the perception of disorder in a feminized nature” (Li, 2007, p. 354). Using gender specific pronouns to create a feminine nature can be problematic, since the feminine is vulnerable to oppression. Feminizing nature, then, through language, creates a titanic mindset of vulnerable nature that can and should be easily manipulated. Li explains that it is not uncommon for Chinese people to use the metaphor “the rape of mother earth,” a metaphor which is also used in the United States, when referencing the human exploitation of natural environments.

The ocean is another example of a natural environment described through a whole host of female-specific metaphors that serve to further guide the human perception of nature. The metaphor originates in creation stories, in which the moist and cold properties of water symbolize the life-giving womb, coupled with the color blue that symbolizes female creativity. Water is seen as seductive and transformative, aspects of women that

men historically fear (Pararas-Carayannis & Laoupo, 2007). Gendered ocean metaphors were stirred by creation stories and expanded through history. Ralph Waldo Emerson describes the feminine reproductive powers of the ocean, which move and shape the continents through erosion and heat the land from below for “continual reproduction of continents” (Emerson & Whicher, 1959, p. 58). Sexual metaphors exist, where, for example, ocean currents are considered powerful feminine ‘sucking’ phenomena. A negative view of the ocean as female occurs when natural disasters stem from the ocean, depicting the ocean as an unruly or destructive woman. For example, a hurricane in the movie *Deep Blue Sea* is described as a ‘nasty little bitch of a squall,’ which Cynthia Belmont (2007) argues is purposefully written, based on the deeply embedded cultural assumption of nature as female. Ships and research vessels are said to ‘penetrate’ the female sea.

It is clear that assigning feminine attributes to the ocean creates an anthropocentric and patriarchal metaphor, where the notion of dominating the ocean for human benefit results. The most typical of many forms of anthropocentrism is found in conservation ethics, which consider environmental value through its use or utility to humans (Schug, 2008). Preservationists place a higher value on the nonconsumptive (aesthetic, religious, and recreational) uses of nature. Miller and Kirk (1992) also include tribal ethics within anthropocentrism. The tribal ethic is based on a relationship tribal societies have with their environments, namely that of profound and healthy respect. This ethic is often used within policy arguments by American environmentalists who are concerned with the environmentally exploitative nature of the Judeo-Christian tradition, where the Bible is interpreted so that humans are superior to all other living things and

are free to utilize them for our needs and desires. In addition, a development ethic is most visible within the Judeo-Christian tradition, as it is the attitude that humans are free to use the environment as we see fit. Miller and Kirk explain further:

The development ethic can be long- or short-sighted. In the American context, the sense of inexhaustible natural resources and a commitment to laissez-faire economic policies encouraged an aggressive exploitation of the environment from the time of the Pilgrims until the end of the nineteenth century. Whether the objective is the recovery of oil and gas resources on the outer continental shelf or the enhancement of commercial fish stocks, and whether the time horizon is short or long, the essence of the development ethic lies in the notion that nature exists to be utilized by humans. (p. 244).

Val Plumwood (2002) argues that anthropocentrism threatens our human society and natural environments in what she refers to as the ecological crisis of reason. For Plumwood, anthropocentrism, and the Othering of nature, is a result of rationalist culture and the subsequent failing to situate human societies within ecological categories and the natural environment ethically. She explains:

To the extent that we hyper-separate ourselves from nature and reduce it conceptually in order to justify domination, we not only lose the ability to empathise and to see the non-human sphere in ethical terms, but also get a false sense of our own character and location that includes an illusory sense of autonomy. The failure to see the non-human domain in the richer terms appropriate to ethics licenses supposedly 'purely instrumental' relationships that distort our perceptions and enframings, impoverish our relations and make us

insensitive to dependencies and interconnections—which are thus in turn a prudential hazard. (p. 9)

In other words, through the anthropocentric mind frame, we position ourselves and nature as Other, and at detrimental risk. We limit our ability to clearly see the relationship we have with the Other, including its limitations, what it provides for us, and its ethical value. For Plumwood, we are unable to see the ecological system we rely on. We deny nature fervently as we need it for survival, on the very simplest of levels for basic human sustenance and in the fulfillment of our capitalist society through production. Plumwood argues that *rationalism*, or emphasizing reason as knowledge, distorts contemporary thinking under the influence of capitalism. Plumwood explains that the dualism of reason associated with men and nature associated with women is a recipe for oppression or a justification for domination. The focus on capitalism in the reason-centered western culture has distorted how nature is perceived, allowing for the domination of nature and Other(s), including other cultures and marginalized people, resulting in a commodification of the world. Plumwood explains that western culture “may at one time have facilitated the dominant culture’s comparative advantage over and conquest of other more modest and ecologically-adapted cultures on this planet” (p. 5). Plumwood argues that a major player in human rationalism is science, monological and dualistic, in which scientists “set themselves radically apart from objects of knowledge in a way that refuses objects elements of commonality, mind or intentionality” (p. 45). In other words, scientists are justified in the domination and manipulation of nature, because the knowledge scientists possess is privatized and used for their own benefit. Science favors anthropocentric knowledge, with an end goal of total human domination of nature,

particularly as nature is treated as replaceable and easily replicated. Many forms of science support *ecological denial*, in which more energy is spent denying that an ecological issue exists or is important or pressing than actually dealing with the issue. Plumwood argues for the development of environmental culture that opposes the highly rationalist perspective, whereby we value nature and its role in our lives, and acknowledge issues facing the non-human sphere, in addition to making good decisions regarding our relationship and influence on nature.

What Plumwood is arguing for is a cultural paradigm shift to a more biocentric view of humanity's relation with the physical world. Contrasting anthropocentrism, the *biocentric* view holds that humans have a place within nature, and all living beings have value regardless of human use or opinion. According to Taylor (1981), this viewpoint offers an attitude that can augment our approach to the commons in ways that are more thoughtful and have an underlying respect for nature. Miller and Kirk (1992) offer two subcategories of biocentric ethics as well: the compassionate ethic and holoethic. The compassionate ethic asks us to recognize that the environment is vulnerable and needs protection from degrading human interference. They argue that humans are responsible for preserving Others without special privileges. The holoethic promotes an analogy between an organism and, say, an ocean, and focuses on the interrelationships of the living and nonliving communities. Unlike the compassionate ethic, however, the holoethic looks beyond individual organisms or species. Miller and Kirk say, "Holoethic thinking wishes to preserve the seabirds and dolphins not because they are 'cute,' but because long-run ecological disaster might conceivably follow their eradication" (p. 246).

Aldo Leopold's (1949) land ethic was early evidence of holoethical thinking. His ethic repositions humans from conquerors of the land to citizens of the land, in community with it. Leopold's land ethic also argues that preservation is morally good. He says, "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise" (p. 262). Not everyone identifies as the "conqueror," but our culture is exemplified by "managers," those who make administrative decisions about the environment, and general consumers who make decisions through consumption. Leopold argues for holoethical thinking to become a natural move as part of human evolution. We should see ourselves more ecologically. It would be our fulfillment within the ecological niche to move from conqueror to cooperator, which will better allow us to preserve the biotic community. Consider the ocean specifically, which is only a small part of the larger natural world, but an apt example. The vastness of the ocean creates a condition where it is assumed that it is too large for humanity to do any irreversible damage (Schug, 2008). However, if we effectively challenge the root metaphors found in Beauvoir's work and amend her work to include the land ethic and importance of the ocean, there should be a paradigm shift toward biocentric holoethical thinking. Accepting the biocentric view, we recognize that all marine species have intrinsic value and are part of a complex environment of interconnected organisms, objects, and events.

Ultimately, we can see through these examples that root metaphors such as patriarchy and anthropocentrism, both influential in Beauvoir's erotic ethic because they are incorporated to free women from domination, create a rift between humans and nature. We should reject the assumption in Beauvoir's erotic ethic that we can dominate

or disregard nature for exclusive human benefit, maintaining nature as Other as part of the project to free women. If we challenge patriarchy and anthropocentrism, I suspect we can begin to cultivate an erotic ethic that doesn't support a choice regarding whether to protect and conserve nature, but rather see it as a responsibility as part of the project.

### **The Eroticism of Woman**

Beauvoir argues that men are dominant historically over women in part because of their cultural and societal positions. For Beauvoir, the daily social and cultural aspects of men's lives grant them a more superior position to the merely naturally influenced lives of women, because men are more apt to risk life rather than give life. This aspect of "risking" is important to Beauvoir's argument:

The worst curse on woman is her exclusion from warrior expeditions; it is not in giving life but in risking his life that man raises himself above the animal; this is why throughout humanity, superiority has been granted not to the sex that gives birth but to the one that kills. (2011, p. 74)

Beauvoir argues that men create beyond their reproductive capacity, using their knowledge and the resources available to them to become long-lasting, transcendent objects. Women, on the other hand, create only other humans—a perishable object. Although I grant that Beauvoir's most influential work was written decades ago, before a shift in the cultural climate toward women she hoped to help accomplish, I nevertheless argue against Beauvoir's position on the fate of women based on their genetic predisposition. The sexually embodied woman is not burdened or oppressed by those biological differences that separate her from man. More specifically, women should not



be valued based on their fertility. Their freedom should not be limited based on assuming the role of motherhood, or more still, when they go through menopause and are no longer able to bear children. I open this discussion on the value of women by borrowing words from a modern feminist icon, Ani DiFranco:

*I am not an angry girl  
but it seems like  
I've got everyone fooled  
Every time I say something  
they find hard to hear  
they chalk it up to my anger  
never to their own fear  
Imagine you're a girl  
just trying to finally come clean  
knowing full well they'd prefer  
you were dirty  
and smiling  
I'm sorry  
but I am not a maiden fair  
and I am not a kitten  
stuck up a tree somewhere  
//I am not a pretty girl  
I don't really want to be a pretty girl  
I want to be more than a pretty girl  
(DiFranco, 1995)*

I was seventeen when I first heard this song by Ani DiFranco. I think it is fair to say that I was an angst-ridden teenager, even at seventeen when I thought I should have had things figured out. Though I am sure you would be hard-pressed to find a teenager that wasn't brimming with insecurities, I knew many of mine stemmed from my parent's divorce, the shuffling and reconfiguring of my family, and of course, my surgery. As was the case with many of Ani's songs, I felt a poignant sense of understanding when I listened to *Not a Pretty Girl*. To be clear, I was not a part of the "pretty girl" clique in school; but for me, this song is about more than appearances. This song is about choosing a different path for

yourself as a woman than what is expected of you. It's about facing the expectations of others and believing you are worth more and fighting for a better life. Beauvoir argues that women perpetuate their position in society, but this song is about proving to men and women alike that we aren't weak, passive beings, whose sole value is based on the number and quality of our offspring. In the song, DiFranco doesn't want to be compared to a helpless kitten stuck in a tree, in need of a neighbor's tall ladder or the help of the fire department to get it down. DiFranco asks a valid question, "Don't you think every kitten figures out how to get down whether or not you ever show up?" How often do you really see a kitten waiting in a tree to die without at least trying to get down on its own? DiFranco is arguing that women are capable of fending for themselves and should be taken at more than biological or assumed value. Wanting to be more than a pretty girl is wanting to be considered as more than a womb; it's about being valued for more than our bodies' basic biologic function, but for our intelligence, our compassion, and our erotic relationships. Being more than a "pretty girl" is ultimately about fighting for the right to achieve transcendence. DiFranco is singing out against Beauvoir's view that the normal biological cycle, motherhood, and menopause are a burden, form of oppression, and limit to a woman's freedom. We need to examine these issues further in order to fully clarify the limitations of Beauvoir's assumptions.

### *Sexual Freedom*

The notion that women are valued based on their reproductive capabilities is typical of a patriarchal society. Beauvoir repeats that women are slaves to their species, reduced to their biological function. Men have an entirely different “anatomical destiny.” Beauvoir explains:

Patriarchal civilization condemned woman to chastity; the right of man to relieve his sexual desires is more or less openly recognized, whereas woman is confined within marriage: for her the act of flesh, if not sanctified by the code, by a sacrament, is a fault, a fall, a defeat, a weakness; she is obliged to defend her virtue, her honor; if she “gives in” or if she “falls,” she arouses disdain, whereas even the blame inflicted on her vanquisher brings him admiration. (2011, p. 386)

Women are thus banned to chastity because of the perceived sinful nature of her sexuality. Beauvoir explains that men are granted more sexual freedom, regardless of marital status, because man is not confined to his biological function. Further evidencing female oppression, any sexual relationship proves male domination through such patriarchal metaphors as he “had her,” “takes her,” or “possessed her.” Men claim that they “conquer” or “defeat” women during sexual intercourse. Beauvoir explains that even when a man vulgarly refers to sex as “fucking” someone, it is still an act he does to the woman as a conqueror, not an act that they mutually engage in together. Women, on the other hand, are most often referred to with such qualifiers as “hot” or cold,” enforcing the notion that they can never be more than passive beings.

Remember that Beauvoir challenges us to assume our ambiguity, particularly in this case, for women to gain equality to men. In an effort to do so, she suggests that women reject the passive qualifiers typically associated with women. This also applies

more specifically to sexual freedom. For Beauvoir, in order to dispel the double standard of sexual behavior, the women should have the same sexual freedom as a man, without worrying about negative, shaming repercussions. Beauvoir explains:

A woman who works hard, who has responsibilities, and who knows how harsh the struggle is against the world's obstacles needs—like the male—not only to satisfy her physical desires but also to experience the relaxation and diversion provided by enjoyable sexual adventures. (2011, p. 727)

As women are increasingly embracing their sexual freedom, there is an upsurge in the demand for effective birth control methods. Although Beauvoir fights ardently for the right to birth control options, she questions the use of one method in particular. Beauvoir's main complaint with chastity, a birth control method commonly associated with strong patriarchal societies and religious groups hoping to maintain sexual purity before marriage, is that women have sexual desires and should not hold back from acting upon them. For women to consider sexual acts shamefully, not act upon them, or act timidly is to repress her sexuality. She lists several methods for women to consider abstinence at any point in their lives, regardless of marital status: focus on career, "resentment, spite, fear of pregnancy, abortion trauma," (2011, p. 424) and so on. She explains, however, that the real point of a woman experimenting with chastity is to affirm herself, but she ultimately becomes upset over the limitations she self-imposes on her feminine possibilities. Beauvoir insists that even the chaste woman, whatever her reason, has sexual desires even as she rejects them. Essentially, then, abstaining from sex for whatever the reason, including as a viable birth control method, does not align with Beauvoir's theory pertaining to sexual freedom because it limits a woman's sexuality.

Beauvoir insists that women should have the same sexual freedom as men, explaining that women should act on sexual urges just as a man would. However, the details of her theory on sexual freedom are problematic. Namely, there is a difference between acting on a desire simply because you have it and acting on it because it is the right thing to do. Beauvoir is clear that when a man rapes a woman, it is a crime and an act of oppression. So, when she says that men have sexual freedom, the same sexual freedom she wants women to fight for, it isn't black and white. Men should not rape women; they should not act on all sexual impulses. Likewise, women should not act on all sexual impulses if it is not the right thing to do. In certain situations, considering abstinence may be the most responsible and generous thing a woman can do both for her potential sexual partner and herself. If a woman desires a sexual relationship with another person, and the desire is consensual, then she should have the choice to engage in such a relationship. However, if participating in a consensual sexual relationship results in some way in the oppression of her partner or herself, even self-inflicted, she should not engage. It is a woman's right to abstain from sex to protect herself and her partner from an unwanted pregnancy. It would be irresponsible and oppressive for a woman to act upon her sexual impulse if there is absolutely no interest in a potential pregnancy from either party, particularly if abstinence is the only birth control method available in the moment. Despite Beauvoir's theory, chastity can be used in other ways beyond birth control methods. A woman has the right to choose to abstain to concentrate her efforts and energy on more fruitful projects. Though she may still feel the desire for sexual gratification, if a woman feels her time, energy, and desire is better spent focusing on her career, her family or friends, an important cause, the Other, then it is her responsibility to

channel her energy and desire to act generously for her project. Beauvoir focuses so intently on ensuring that women have (sexual) freedom that she has inadvertently restricted the very thing she is fighting for. Choosing to refrain from acting upon sexual desires could be considered as participating in freedom of choice so long as the chaste woman is not doing it out of spite, resentment, or punishment, but rather to exert her energies for a more worthwhile project.

### *Voluntary Motherhood*

While birth control methods and research for population control existed for almost a century prior, the feminist movement began pushing for a birth control method to suit the needs of women in the late nineteenth century. *Voluntary motherhood* was the first general term used in the United States to describe the feminist birth control demand. This is different from demand stemming from certain groups still interested in using population control for various methods, including those considering the environmental impact humans cause. The feminist birth control demand resulted from the feminist understanding that part of the oppression of women stemmed from unwanted pregnancies and child rearing (Gordon, 1973), which Beauvoir also subscribed. Though Beauvoir fought for women's freedom of choice, and various methods of birth control are now legal in the United States, many women across the country still suffer from a social oppression that keeps them from making their own decisions about their fertility. Feminists proclaim that the invention and mainstreaming of birth control methods, including contraception and abortion, freed women to join the ranks of men. It gave them the option of motherhood, not condemned them to be determined by their body. With the

freedom of choice, women initially could decide whether or not they wanted to be mothers. With the advancement of technology and our increased understanding of the human body, women now manipulate their hormones to avoid having a menstrual period for months at a time. These options allow women to decide their own fate. If a woman chooses to use birth control methods, it gives her the option of leaving the home to seek employment elsewhere. Women that have children may later use some method of birth control to decide for themselves how many children they choose to have and how many years they want to spend in the most energy intensive years of child-raising.

Generally, the debate over birth control, regardless of the kind, centers around an ethical question of when life begins and whether we should be able to “play God” by determining our own reproductive fate. As a result, one of the greatest sources of stigma for birth control is the fear of social stigma. This stigma is often, but not always, through religious persecution, primarily because most religious groups take a strong stand on issues such as contraception and, more particularly, abortion. Many general practice physicians, especially in small communities, that have the skill and equipment necessary to perform abortions do not for fear of community backlash. Likewise, many young people with an interest in contraception, ‘morning after pills,’ or an abortion do not seek guidance for fear that their parents, guardians, teachers, religious or community leaders may find out, thereby also discovering that they are having possible premarital sex. Sources of social stigma, such as the marital status of a pregnant woman, influences decisions women make with respect to unwanted pregnancies. Marcia Ellison (2003) finds that in cases of unintentional pregnancies, women who obtain abortions do so because of their own personal needs and beliefs, and women who carry the child to term

and put it up for adoption do so as a result of external social pressures, and finally, women who choose to be single mothers do so because of moral and religious beliefs. Many women who become pregnant find it easier to cope with the role of motherhood, even to become a single or teenage mother, because the disapproval felt from family, community or the personal misery felt over the unwanted pregnancy pales in comparison to the sense of moral or religious obligation she feels or the response she may receive from her religious community.

In an interview with Susan Brison (2003), Beauvoir discusses the importance of tackling issues in feminism that affect all women. By all women, Beauvoir means that in order for women to gain more ground in the feminist movement, gaining greater access to freedom and equality with men, they must join forces across social classes, races, and ages to fight for issues that affect them. Moreover, Beauvoir compares abortion laws to anti-rape and domestic abuse laws. She argues that an unplanned and unwanted pregnancy is as likely to happen to a housemaid as it is to a doctor's wife, just as is rape and domestic abuse. Therefore, if there are anti-rape and domestic abuse laws, there too should be rights to legal abortion. Although logical, the problem remains that not all women can actually access the means necessary to obtain a legal, sterile abortion. Even though it is just as likely for lower class women to get pregnant with an unwanted pregnancy as a woman from a higher class, despite the legal possibility of obtaining an abortion, it is not always possible financially for a variety of reasons for the lower class woman to find the funds necessary to terminate a pregnancy, with few exceptions. On the other hand, women can receive financial assistance from the government when they have children that they cannot financially provide for and tax breaks just for having children



and for childcare as long as the child is also their dependent. In many cases, the choice to have a child despite initial desire is obvious. The social stigma and economic inequality facing this issue is reminiscent of Plato's *The Republic*, in which equality for women only applied to the upper or guardian classes and implied that the welfare and happiness of the "inferior" classes cannot be met, thus dooming them to a life of poverty, oppression, and an unequal education to the higher classes (Bloom, 1968). Although Beauvoir argues for legal access to birth control methods in an effort to grant women freedom to be on equal footing to men biologically (ideally), which would afford greater transcendence, her argument is still flawed. The need for voluntary motherhood is an issue that affects all women, but her argument fails to address the fact that not all women, despite legality, actually have equal access to bodily means that Beauvoir hopes will loosen the tethers of oppression on women. Essentially, her argument holds ideally but not pragmatically. Although this may not be important to Beauvoir, it is essential to consider these arguments in light of her theory being fruitful in education.

### *Motherhood*

Beauvoir argues that women reach their physiological potential through motherhood, but at the expense of achieving transcendence. Her disdain for motherhood is evident when she asserts the notion that to become a mother tethers a woman to a life role that is so all consuming, it prevents women from doing anything other than their biological function, including more specifically attaining equality with men. She explains:

The female, more than the male, is prey to the species; humanity has always tried to escape from its species' destiny; with the invention of the tool, maintenance of

life became activity and project for man, while motherhood left woman riveted to her body like the animal. (Beauvoir, 2011, p. 75)

Her lengthy discussion on motherhood in *The Second Sex* is centered generally around the need for legal abortion, the misery of menstruation and motherhood, the mixed feelings resulting in pregnancy and child rearing, and these threats to the equality of women. For Beauvoir, pregnancy is a drama played out within a pregnant woman, both great and utterly terrible. She explains that the feeling pregnant women get of “no longer [being] an object subjugated by a subject” where her “body is finally her own since it is the child’s that belongs to her” (2011, p. 539) is simply an illusion. The child is made in her, not from her. Beauvoir explains that mothers are often masochistic or unfulfilled sexually and socially, making them cruel. This cruelty, often expressed through physical violence on the child, insults, punishments, and outbursts, resembles acts of domination. She argues that raising children is an unnatural thing, particularly because all women bring some form of baggage to the role of motherhood. For example, Beauvoir suggests that poor mother-child relationships result from the negative past experiences and lingering feelings the mother may have, particularly those stemming from her own parent-child relationships. Beauvoir further argues that it is impossible for motherhood to grant women equality to men, as a child cannot give to women what the penis gives to men. For Beauvoir, motherhood, from the beginning of pregnancy to the entire extent of child rearing, locks women into a commitment that is so intensive they are unable to ever gain equal footing to men. She describes the inconvenience, pain, and misery associated with motherhood, but more importantly to her, she explains that the oppression motherhood reveals reinforces the Othering of women. Motherhood, however, does not

limit a woman's freedom, nor does the desire to be the best mother one can be erase the work feminists have fought so hard for.

Before I continue, I want to make clear that my definition of mother is not the same as that of Beauvoir. Her definition is strictly that of a woman who is impregnated and carries a baby to term, though in most cases her notion of motherhood includes raising the baby into adulthood. In my life I have met a variety of people not fitting this description that I would consider a mother. For example, a friend of mine from high school has Lupus and is unable to get pregnant on her own due to her disorder. She and her husband recently adopted a four-year-old child. She never experienced pregnancy or childbirth and didn't even raise her daughter through infancy, but she is her mother. I have lesbian friends who get pregnant through artificial insemination. Though only one of them actually is pregnant and gives birth, both are mothers to their daughter. Women can be mothers even when they have trouble conceiving and undergo fertility treatments or participate in genetic counseling and in vitro fertilization to protect their future children from genetic disorders if the end result is a caring and erotic relationship with their child. In a similar way, many fathers I know are 'mothers' in their own way, obviously not through pregnancy or childbirth, but through the relationship they have with their children. Nannies, daycare employees, and teachers could be 'mothers,' depending on the relationship they have with the children they care for. Motherhood, then, is not limited to biology. Mothers share relationships with their children that are intimate, caring, and ultimately, erotic. Mothers challenge their children to assume their own ambiguity and guide them to make meaning in their own life. Through their generosity, care, and the model they provide in their erotic relationship, mothers help

their children to see that they have the capacity and the strength to act morally, live ethically, and take their responsibility to their project and the Other(s) seriously. Mothers strive for a caring and relational experience with their children, teaching them about ethical decision-making. Nel Noddings explains the importance of mothers in ethics:

One might say that ethics has been discussed largely in the language of the father: in principles and propositions, in terms such as justifications, fairness and justice. The mother's voice has been largely silent. Human caring and the memory of caring and being cared for, which I shall argue form the foundation of ethical behaviour, have not received attention, except as outcomes of ethical behaviour. (1983, p. 1)

Generally, I do not limit motherhood to the fertility and biological function as Beauvoir does. For instance, I would not consider a surrogate mother or a woman who drops her unwanted child off at designated locations under the safe-haven laws mothers. Although these women acted generously by sacrificing their bodies and aspects of their lifestyle and cared for the child they grew inside of them, even enough to let someone else raise the baby knowing it was in the child's best interest, they are missing the relational component of motherhood that sets it apart.

Motherhood begs women to take on responsibilities, regardless of preparation, for an Other, the child. Mothers assume their ambiguity innately and act with generosity by setting themselves, their bodies and needs, aside for the sake of a baby. Although at initial glance it is easy to see why Beauvoir would view such sacrifices as limiting one's own freedom, motherhood is so deeply erotic and relational with a baby that defies the logic of Beauvoir's argument. Motherhood actually allows women certain freedoms that

women without children do not have. Beauvoir admits to one freedom: a woman gains total emancipation when she becomes a mother, because she then takes the place of her own mother. That is, Beauvoir suggests that a woman is no longer required to be submissive to her mother, because becoming a mother puts her in the position of the dominant. However, there are other freedoms motherhood grants that Beauvoir does not mention. When I was pregnant with my oldest son, I was nervous, as I am sure most first time mothers are. I was afraid I would not know how to care for him, understand his cries, feed him enough or be able to get him to sleep. He would not know how much I love him, or that I would spoil him. I had a lot of fears. Upon expressing my fears to other mothers, so many of them told me, "You'll be surprised at how natural it is. You'll just know how to care for him, because you are his mother." This didn't make a whole lot of sense to me at the time, but after my son was born, I felt this way. Beauvoir argues that there is nothing natural about raising children, but becoming a mother, regardless of whether or not you are the birth mother, unlocks an instinctual, primal knowledge of how to care for your child. This is one example of a freedom granted through motherhood. Not all mothers have the same instinct, but this instinctual knowledge is evolutionary. Mothers care for their young in the best way they can to ensure survival for their kin. Although my oldest is only two and a half, I experience discussions with other mothers who insist that their methods of child raising are far superior to mine, who might scoff at my use of cloth diapers, the length of time that I breastfeed, or my methods of discipline. But the choices I make in parenting come from the deepest part of my consciousness, where a primal knowledge stems from. I have confidence in my parenting, and this experience changes how I relate with others. A second freedom: motherhood changes the

way all mothers relate to others. The deeply relational experience of motherhood allows mothers to act in reciprocity and with erotic generosities to find and express love, to care for Others, and to seek freedom for Others.

In *The Second Sex* Beauvoir argues that motherhood is not reciprocal. Babies are born needing constant care, and this care continues in varying degrees through adolescence. According to Beauvoir, women do not need children reciprocally. Although many women pine for children, love pregnancy and childbirth, and adore their children, Beauvoir explains that motherhood is more like a prison, and would definitely not be classified as a necessity. In her sixties, Beauvoir adopted a younger woman, a friend and companion, in order to grant this friend economic freedom upon her death. Beauvoir therefore had an adopted “daughter,” but had no other children and was never a mother. Her theories of motherhood are diametrically opposed to the idea of motherhood as morally reciprocal. When a mother is ethically honest with herself and understands her relationship with her children, she will admit that motherhood is mutually beneficial. This relational reciprocity grants further freedoms, as mothers care for their children, teach and love them, and grant erotic generosities. They guide their children to freedom, which is a unique pathway of granting freedom to the Other that only motherhood allows. Children transform their mothers. In many ways, when women become mothers, they are defined by motherhood. Through these examples, we can see that the irony of Beauvoir’s idea of motherhood is that motherhood is actually liberating. Through the act and generosity of mothering, women gain confidence and become empowered. Mothers are able to draw from their strengths and positive attributes to care for their children. They are able to gain control at the most challenging moments of time, pair down to the

essentials in life if necessary, take responsibility for themselves and their children, and care deeply. Very few mothers negate their responsibility to their children. When acknowledged as reciprocal, children also bring mothers closer to earth. Mothers work harder to use this primal, ancestral knowledge to guide their children through life in the most erotic way they can to guide them to transcendence. I come back to this point in chapter four.

Beauvoir argues that motherhood dooms women to further dependency. Initially women are dependent upon their parents, then their husbands, and finally they are dependent upon their children, because “it is again by proxy that she transcends herself through the universe and time” (2011, p. 568). A mother’s life changes, though not significantly as prior feelings are merely deflected upon the child: A woman disgusted with her husband suddenly finds herself dreading her baby, an unsatisfied woman takes her vengeance out on the child, and a woman who conceives to fulfill the desire to be needed still feels alone. It is true that when a woman becomes a mother, her life changes forever. The person she was before motherhood no longer exists; her projects, her goals, and her perception of the world are different as a result of the experiences of motherhood. But rather than Beauvoir’s notion of this transformation, a mother by my definition grows as this opportunity allows her to assume her ambiguity and develop meaningful erotic relationships. Motherhood, then, is not disabling as well as erotic, because the transformation mothers make is an act of transcendence. A child enables a mother to achieve freedom in part as they reflect upon their relationship with their child and consider their inherent mothering knowledge in order to raise their child. Women grow through the experience of motherhood, just as students grow in their knowledge through

the experiences and reflections on learning. This growth can never be undone; mothers continue to grow as their relationship with their child evolves. Mothers of adult children and mothers who experience the loss of a child do not suddenly find themselves freed from the obligation of motherhood, happy to return to their previous life. That life no longer exists, so it can never be returned to. Through these scenarios, women are then just considered to have achieved some level of transcendence through the erotic relationship with their children. Women undoubtedly mourn to varying degree the loss of a child or the adjustment to life with an empty nest, but this is not an unhealthy obsession or a woman seeking a quick fix when found suddenly unneeded, as Beauvoir might suggest. This grief occurs at the severance of the reciprocal erotic relationship, but it does not mean that the woman is destined for a life of boredom or emptiness now that her purpose in life, according to Beauvoir, has been fulfilled. Regardless of whether or not a woman is a mother, life continues beyond childbearing years.

### *Menopause*

Beauvoir claims that women are trapped in their female function, valued by their fertility. Because of this relationship, onset of menopause marks what Beauvoir refers to as the “dangerous age.” Women are socialized from a young age to understand that they are not born women; they become women. According to Beauvoir, puberty marks the beginning of femininity and womanliness. It is the point at which women are found valuable, because it is the same moment in which they are able to reproduce. Beauvoir explains that girls are anxious to begin puberty so that they can embrace their role and find meaning in life, while women are fearful of aging, because they know their freedom is



limited with the onset of menopause. Their bodies will begin to “fail,” and society generally will not view them as fertile and valuable. Beauvoir argues that men who value their wife, lover, mistress, as a sexual partner based primarily on her fertility, will reconsider her value based on her inability to procreate. Women lose their essential function.

Beauvoir explains that “when the inevitable, irreversible process starts, which is going to destroy in her the whole edifice constructed during puberty, she feels touched by the very inevitability of death” (2011, p. 620). As women’s identities are so closely linked to their womanhood, they go through a period of disillusionment and depersonalization during menopause, which Beauvoir describes as a sort of death before death. Beauvoir writes that women helplessly stand by as their flesh degenerates and becomes something different than the youthful flesh they are familiar with. She explains that women associate menopause with an almost total loss of sexual desire or intimate moments and the passion for exploration and new adventures, making life less worthwhile and giving less to look forward to. For reasons like this, Beauvoir asserts that many older women lose their will to continue projects, go on new adventures, and pursue passions. In this very assertion, Beauvoir limits the menopausal and postmenopausal women who continue their project and exciting experiences without hesitation or consideration for their age.

Menopausal and postmenopausal women don’t have to be limited in their freedom because of their infertility. Despite the change in body chemistry and the seeming shift in personal value, Moira Gatens (2003) argues, “brute fact alone cannot determine human action” (p. 271). Gatens explains that a woman’s self perception is all that is necessary to

determine her worth. Although menopause is not reversible and is inevitable, it doesn't have to be the final phase of a woman's life, leaving her with nothing left but a death sentence. It is up to her to respond appropriately to the changes in her life so that her value is not based solely on her fertility.

That being said, many menopausal women are taking control of their bodies and their lives and changing the perception of the types of freedom menopausal and postmenopausal women have. They take hormone replacement therapy or use natural treatment options to combat some of the major inconveniences women experience in menopause: hot flashes, loss of sex drive, affected cognition and memory, and vulnerability to depression or mood swings. Beauvoir might argue that these physical changes in a woman's body during menopause limit her freedom, because they strip a woman of her confidence in herself and her ability to socialize as she once did. Menopausal and postmenopausal women also take medication to reverse bone loss, another common symptom. Through these types of intervention, women are finding freedom from the negative physical associations to menopause. However, they are also going through a type of transformation similar to the one found in motherhood: they become more confident in themselves because of their freedom to make these decisions for their body. Further, with the advancement of technology, some perimenopausal women choose to use fertility treatments in order to conceive and become a mother. Through this option, they are exercising their freedom to be in charge of their own fertility. Menopausal and postmenopausal women get surrogates or adopt to become mothers. Women in all stages of menopause that choose to be mothers embrace their ambiguity and explore the erotic relationship involved in motherhood, which grants

greater freedoms as was previously discussed. Menopausal women, as classified in part by their advancement in age, are treated as pariahs just as Beauvoir claims the aged are.

### **Summary**

Beauvoir's erotic ethic outlines sexually embodied beings capable of assuming their own ambiguity, seeking it out in the Other, and acting in erotic generosity to grant freedom and happiness of the Other, rather than binding the Other through oppression. Her erotic ethic, however, is limited by assumptions of the Other. I raised concerns regarding the Othering of nature and the eroticism of women, particularly through the role of mother. Scholars such as Val Plumwood (2002), Claudia Card (2003), and Maria Mies (1993) help me to extend Beauvoir's erotic ethic to a more inclusive erotic ethic that encourages us to challenge harmful root metaphors and rationalism in order to view nature as valuable in its own right, because of which we should understand the protection and conservation of nature as a responsibility. Connecting with other scholars such as Moira Gatens (2003), Marcia Ellison (2003), and Susan Brison (2003), I argued for the eroticism and freedom of women through motherhood and menopause. I showed the possibilities for transcendence through motherhood. Finally, I established that menopausal women have a responsibility to the Other and are fully capable of maintaining their projects. My expectation is that through challenging these assumptions, I have clarified and opened up the erotic ethic to make it more amenable to the type of ethic needed in science education for the ethical teaching of the protection and conservation of nature.

In the next chapter, I will discuss the importance of an erotic ethic in science education for granting students a greater potential for transcendence. I will examine possibilities an erotic ethic in science education can provide for helping students understand their responsibilities to the Other and strategies for acting with erotic generosities. Within this, I will establish three arguments to validate an erotic ethic in science education, which will include the position of ocean as Other and need for an erotic ethic of the ocean, the significance of equal access to marine science education across the country, and phenomenology of place of the ocean for science education.

## **Chapter 4: Revealing an Erotic Ethic for Science Education**

My objective in chapter three was to clarify Simone de Beauvoir's assumptions of the erotic Other in order to establish a foundation for an erotic ethic in science education. Notwithstanding these assumptions, my philosophy of the erotic ethic is closely aligned with that of Beauvoir (1944, 1948, 2011). In brief, the premise of the erotic ethic is people assuming their natural ambiguity to grant freedom to self and Other. As ambiguous, embodied, and erotic people, we must pursue the freedom of the Other in order to propel our projects together into the future. This philosophy has the potential to result in transcendence for self, which is our ultimate goal. In working toward this transcendence, we develop an erotic relationship with the Other that results in mutual reciprocity. We are acting with erotic generosity when we seek and act for the freedom of the Other. Rather than position nature as an Other in order to gain equality with men as Beauvoir suggests (2011), women have the possibility for transcendence through an erotic relationship with nature. As men and women alike embrace their ambiguity and develop or foster a relationship with nature, they gain an understanding of their responsibility to nature. Through this understanding, they can act with erotic generosity for the freedom of the Other, thus creating a pathway for transcendence. We are reminded that contrary to Beauvoir's stance (2011), women are not tethered to their bodies or reliant on their fertility for worth. Rather, women of all ages and levels of fertility have equal value and potential to work for their projects. Potential equality grants equal possibility for transcendence. A better understanding of the responsibilities, abilities, and possible

pathways to transcendence of the assumed ‘Other’ illuminates the potential of the erotic ethic in science education. At the most basic level, we should attempt to achieve an erotic ethic as described by Abram:

It may be...an ethic that would lead us to respect and heed not only the lives of our fellow humans but also the life and well-being of the rest of nature—will come into existence not primarily through the logical elucidation of new philosophical principles and legislative structures, but through a renewed attentiveness to this perceptual dimension that underlies all our logics, through a rejuvenation of our carnal, sensorial empathy with the living land that sustains us. (1996, p. 69)

The implication is that an erotic ethic will afford opportunities for students and teachers to consider their responsibilities to the Other. Through the development of their erotic ethic, students can joyfully strive to act more compassionately and ethically.

Before we continue, recall the meaning of erotic generosities to better understand how personal experiences can lead to an erotic relationship joyfully focused on freedom and care of the Other. Generosity occurs when one intentionally gives of self for the sake of the Other. It is a “state of emotional intoxication” (Beauvoir, 1953, p. 33), in which we see aspects of ourselves in the Other without romanticizing the Otherness or diminishing it to our double. At first consideration, the term “emotional intoxication” seems rooted in romanticism. It is exhilarating, enveloping, and all consuming. Yet, the emotional intoxication Beauvoir refers to is based on a mutual relationship, where both participants lose themselves in the embodied consciousness of their erotic encounter. The intoxication is, therefore, a result of an intersubjective embodied experience, not based on the

illogical, unrestricted feelings of an individual. I will return to this point in chapter five. Subsequently, an erotic ethic, and therefore erotic generosity, is only possible when we experience the world openly through the flesh. Further, recall that Simone teaches us to be reliant on ambiguity, not absolutism, in erotic relationships. For example, sex and gender identities assigned through the influence of patriarchy pervert the meanings of desire and subjectivity. This perversion thwarts the conditions necessary for the possibility of erotic reciprocity. As ambiguous, however, we are capable of experiencing the world without objecting or dominating the Other. We can enhance the Other's possibilities instead by recognizing that the Other is responsible for him or herself. In this way, the erotic ethic respects the Other's 'strangeness,' which prevents the Other from further oppression. Becoming allies with the Other, or working with the Other rather than for it, demonstrates our understanding that the Other is important. This alliance with and respect for the uniqueness of the Other is a necessary precursor for erotic generosity.

In order to validate the erotic ethic for science education, I will establish three connecting arguments (A, B, C). Argument A explains the position of ocean as Other and establishes the need for an erotic ethic for the ocean. Argument B explores the significance of marine science education for all people. I address the relevance of marine science education despite proximity to the coast, and in consideration of the impacts of human actions to the health of our bodies and the ocean. The patriarchal understanding of marine science marginalizes certain knowledge about the ocean. I include a discussion on a relational understanding of the ocean, particularly addressing mothering qualities and the role of elders in a community. Argument C establishes a phenomenology of place, which addresses the commodification of the sea. These arguments work together to

develop an erotic ethic for revealing and protecting the eroticism of the ocean in science education.

### **Argument A: The Ocean As Other**

*“There were simply too many human beings placing too many demands on too little water.”* --James O’Brien

In chapter two I defined the Other as different from self, and therefore generally considered inferior to self and those similar. For Beauvoir, the Other is associated with the characteristics of women in patriarchal society: weak, voiceless, passive, and valued based on the potential for production. Because it is considered inferior and feminized through patriarchal constructions, the Other is generally characterized as having less possibility. Subsequently, the Other is more vulnerable to objectification and oppression. In consideration of this notion of Other, the ocean and its inhabitants are an example of an Other—the ocean-Other. The ocean is not a single living entity in the sense that it can not be sexed or gendered. In chapter three I discussed the dangers associated with the feminization of the ocean through root metaphors. However, as the ocean as Other becomes ocean-Other, the ocean takes on personification. For the phenomenologist, the personification of the ocean for the sake of valuing its Otherness is appropriate and significant (c.f., Abram, 1996). But I will address possible scrutiny associated with categories of anthropomorphism for the ocean-Other in chapter five. For now, accepted within the purview of phenomenology, the anthropomorphism of ocean-Other is a way to understand the parameters of violence and generosity with the ocean.



Apart from the objectification of the ocean-Other through gender identity, the ocean is often regarded as a conquerable entity just as people have considered land. Beauvoir (2011) asserts that freedom is historically and socially situated. People have been trying to dominate the ocean for centuries. Historical accounts depict social influence of ocean objectification and attempted domination. For example, Muslim, Indian, and Chinese traders worked vigorously to gain control of the Indian Ocean for commerce and intercultural purposes centuries ago (DeSilva-Ranasinghe, 2010). The commercial and cross-cultural value was so significant that naval powers submerged in the 10<sup>th</sup> and 11<sup>th</sup> centuries to control which cultural groups and nations were able to engage in commerce and access the ports and maritime trade routes of the Indian Ocean. In fact, until the 1700s the trade situation in the Indian Ocean was considered the most important. Traders from countries near and far took to the ocean to exchange their products, including Chinese silk, Southeast Asian spices, Indian pearls and precious gems, Arabian horses, and East African slaves and ivory. During the Age of Discovery, this image would have been seen in along the Indian Ocean and into the Atlantic Ocean as vessels ventured out for exploration and colonization.

With the increase of agricultural practices, globalization, and capitalism over time, nations worldwide further developed their coastlines. They dug out channels and rerouted rivers to accommodate freight ships. With the colonization of North America, our coastlines have also been affected. The battle over the Louisiana wetlands is a prime example. The Louisiana wetlands are ever changing. The changes occurred initially through natural processes, where the most prominent change is the dynamic movement and direction of the Mississippi River. As residents and industry began living along the

Louisiana coast, they adapted the wetlands to suit their needs and make their lives more comfortable. People became more fearful of the ever changing, unpredictable coastal environment. The objectification of the coastline results from the human attempt to switch from being perceived weak to that of the victor. Louisianans built structures to protect their homes and communities from flooding as a means to control their own destiny. The residential and industrial demands of Louisianans further objectified the ocean as forests were clear-cut and land was leveled for farming and development.

Domination of the ocean often occurs because of the perception that the ocean is autonomous, independent, or without ownership. For-profit companies are pursuing the rights to obtain water by drawing it down from the icecaps of Greenland (Rothfeder, 2001). These companies are attempting to harness the ocean in order to have water to sell. As depicted in the movie *The Cove*, tens of thousands of dolphins are hunted each year for meat, for sport, or to be sent to dolphin swim programs, aquariums, zoos, or places like Sea World. Just recently, for example, the Georgia Aquarium has applied for a federal import permit to keep 18 beluga whales in captivity for breeding research, education, and entertainment (Barringer, 2012). They applied for the permit despite fierce opposition from animal rights activists who argue that marine mammals are too intelligent and social to be kept in captivity without affecting their wellbeing. With the development of aquaculture, mangrove and other natural coastal habitats are destroyed to make room for fish and shrimp farms (Low, Arshad, & Lim, 1994; Sasekumar, 1994; Primavera, 2000; Valiela & Bowen, 2001). For centuries people have been trying to dominate the ocean for food sources, commerce, and trade routes. The examples of attempted ocean-Other domination abound. Perhaps it is because the ocean is the world's

greatest commons. With the exception of the Exclusive Economic Zone (EEZ), the ocean is largely unregulated and unassigned. The EEZ is the territorial sea and continental shelf within 200 nautical miles of a coastline that can be used for the exploration and use of the various marine resources. The US Coast Guard is the law enforcement agency in the United States that regulates this zone. Approximately ninety percent of the total ocean volume and sixty percent of the surface of the ocean lies outside of the EEZ. The zone outside of the EEZ not restricted by national jurisdiction is subject to high levels of exploitation and degradation. Because the EEZ are only imagined lines and regulation does not exist beyond these borders (with the exception of private “sea-watch” organizations, who strive to protect fisheries), nations indulge their self-interests. This free-for-all situation creates the pollution and overfishing of many vast areas without any question.

Often the sea demonstrates its power against man. Though reputable agencies such as the Army Corp of Engineers built levees, canals, and floodwalls to keep the sea out of New Orleans, we are unable to successfully prevent the ocean from breeching the artificial barriers and drainage systems to come ashore during Hurricanes, for example. The world’s largest seawall failed in Japan when a tsunami in 2011 devastated the coastal zone, flooding cities, and killing thousands of people. In these and numerous other instances, the ocean demonstrates that it cannot be objectified, dominated or possessed, despite the best attempts of scientists and engineers. Subsequently, the ocean is characteristically described in science and engineering as wild and disorderly. Although these terms are often used as “feminine identifiers,” in this case they may work against objectification. The unyielding power and inability of the ocean to be objectified may

grant those of us who seek a relationship comfort, as we are open to embrace ambiguity and the freedom of the ocean without the binds of patriarchy. Rachel Carson explains:

[Man] cannot control or change the ocean as, in his brief tenancy of earth, he has subdued and plundered the continents. In the artificial world of his cities and towns, he often forgets the true nature of his planet and the long vistas of its history, in which the existence of the race of men has occupied a mere moment of time. The sense of all these things comes to him most clearly in the course of a long ocean voyage, when he watches day after day the receding rim of the horizon, ridged and furrowed by waves; when at night he becomes aware of the earth's rotation as the stars pass overhead; or when, alone in this world of water and sky, he feels the loneliness of his earth in space. And then, as never on land, he knows the truth that his world is a water world...(1955, p. 15)

In the face of our best attempts to objectify the ocean, when we stand at the ocean shoreline and watch the crashing waves, witness a seabird dip beneath the water's surface to catch its dinner, or feel the pelting of rain on our skin from a tropical storm, we know in our bodies that dominating the ocean is not in the realm of possibility. This mindful emotional and intuitive response to the condition of the ocean-Other may be the opening for the establishment of an erotic relationship within us, as described by Beauvoir:

It is only as something strange, forbidden, as something free that the [O]ther is revealed as an [O]ther. And to love him genuinely is to love him in his [O]therness and in that freedom by which he escapes. Love is then the renunciation of possession. (1948, p. 67)

As we fail to fulfill our desire of ocean domination, we are free to pursue a more erotic relationship with the ocean, which grants the ocean-Other freedom. Love can flow from this erotic relationship, because we can accept our inability to objectify the ocean-Other.

Though the ocean does not consist of flesh in the sense that humans do, it is still ‘embodied’ as the consciousness of the ocean body is interconnected with humans and the surrounding environment. Often those involved in an erotic relationship with the ocean at some point find themselves acting with the ocean through a lived experience. Lived experiences with the ocean and “the subcultures in which people reflect upon them, foster understandings of nature as powerful, transformative, healing, and even sacred” (Taylor, 2007, 925). These terms, and even ‘love’ as described by Beauvoir, bring to mind feelings of peace, happiness, and solace. Surfers, whale watchers, and children playing on the beach on a bright summer’s day may exemplify these types of lived experiences. However, not all lived experiences with the ocean are associated with positive experiences. Many commercial fishermen, oilrig workers, and beach lifeguards, for example, may find the long hours spent on the water taxing. This may be particularly true as the tedium of a job along the landscape of the ocean may prevent the workers from actually experiencing the ocean for what it is. People employed through the sea may feel further disdain for the ocean as they spend days or weeks away from their family or in bitter cold and dangerous conditions for their livelihood. In other lived experiences, the ocean can be unwelcoming. Consider the beaches of the Gulf of Mexico after the *Deepwater Horizon* explosion. Many of the affected beaches are acclaimed tourist vacation destinations. In the months following the oil spill, the beaches and surrounding ocean water was contaminated with oil. I received a call from a good friend of mine two

weeks after the *Deepwater Horizon* explosion. She asked me to stop by her research laboratory on the way home from class so she could show me something. When I walked into her lab, she rushed me to another room, where the lab's research refrigerators were kept. She opened one of the refrigerator doors, and it was stocked with tiny glass vials full of water samples from various locations. What I did not expect was oil fumes to completely fill my nostrils when she opened the door. She removed a Mason jar covered with aluminum foil from amongst the vials in the refrigerator. My friend explained that her advisor, a marine photochemist, was visiting his brother in Alabama at the time of the explosion. Though the public was advised not to interact with the oil-laden water and sediment on the beaches, he could not resist running to the beach with the Mason jar to collect a water sample. When she removed the foil to show me the sample, my body covered in chills. She did not have to remove the lid of the Mason jar for me to consider the significance of what had happened during that explosion. The evidence was in the brown, swirling tar balls and the pungent aroma that lingered long after my friend replaced the jar. Consider instead the populations of people living along the Indian Ocean, most of who experienced in some way the effects of the tsunami in 2004. Although Japan holds the record for most tsunamis, the 2004 Indian Ocean tsunami is the most devastating in history. Within twenty-four hours following the massive tsunami, approximately 150, 000 people were dead or missing and millions more were homeless. Imagine the switch in the way that those affected regarded the ocean after the tsunami. Initially, residents along the Indian Ocean may have had a great love for the ocean, or had intense gratitude for the livelihood and sustenance it provided. After losing homes, valuable possessions, community, and loved ones to the ocean that day, it would not be a

far stretch to say that many fear the ocean even today. Others may have regrets, a deep hatred, or a sense of longing or loss. Interestingly, in both situations that foster love and care and those that result in negative associations, people gain a new respect for the power and possibility of the ocean. The perceptions formed through lived experiences are reflective of this state of emotional intoxication Beauvoir describes, particularly if we recall that intoxication can be either euphoric or poisoning. Intoxicated, we are able to see the phenomena of the ocean-Other. This conscious euphoria or perception can help us develop an erotic relationship with the ocean and sets the stage for erotic generosity.

*An Erotic Ethic for the Ocean*

*Let's go swim tonight, darling  
 & Once outside the undertow  
 Just you & me & nothing more  
 If not for love I would be drowning  
 I've seen it work both ways, but I am up  
 Riding high amongst the waves  
 I can feel like I  
 Have a soul that has been saved  
 //Riding high amongst the waves  
 (Pearl Jam, 2009)*

The application of the erotic ethic for nature in general is not limited to the ocean. Let's now focus in depth on how students and teachers reveal and protect the eroticism of the ocean through the erotic ethic and erotic generosities. What is it about the ocean that makes it especially relevant to the development of erotic ethic and erotic generosity? In order to not objectify that Other, which I am trying to free, it is important to acknowledge my understanding that the ocean is especially relevant for me. If asked which natural landscapes one might consider erotically, the ocean may not come to mind first for some.

Perhaps they may consider the mountains, forests, valleys, or deserts. For me and for many, it has always been the ocean. The siren's call of the ocean is compelling because of the ease of the various pathways the ocean uses to lead us into erotic relationships. Specifically, we are drawn to these relationships through the inherent *synaesthetic* qualities and ambiguity of the ocean. In spite of myself, the ocean is especially relevant due to the significance of its role on earth and the influence we have on it.

In *The Spell of the Sensuous* David Abram (1996) speaks of synaesthesia, or the perception formed when the senses fuse, functioning and flourishing together. He argues that we can rediscover the earth through the synaesthesia of lived experiences. When experientially considered, perception is an inherently interactive event between the perceiver and the perceived. Merleau-Ponty (1962) argues that we are inherently synaesthetic. He explains, despite that, as we develop scientific knowledge, we become less aware of our synaesthetic capabilities. The influence of mental training for scientific practice can easily erode our ability to sense. The scientific quest for logical certainty, to categorize the natural world through cultural neutrality and absolute positivism, errs toward logical deduction, withstanding the exploration of the world through our senses. Through desensitization, the quest for science can sever the full participation of our sensing body with the sensuous environment. When we rediscover the earth, our senses are able to fuse in a way that allows us to experience the thing itself as a central focal point of experience. Our senses are profoundly embedded in the natural landscape. When we rediscover the world with our breathing bodies, the perceived world transforms. In the rediscovered world, much of the unnoticed and overlooked moves from the background to the foreground (e.g., Rachel Carson practiced science this way). This transformation in



turn moves the meaningless and desensitized back to highly sensual. Where papers, streetlights, video games, smart phones, and computers lose distinctiveness, birds, blades of grass, and the wind all flourish intensely. When we are in contact with the natural world, our senses become slowly energized and awakened. Through the flesh, we are both sensible and sensitive. In relation to the Other, each of us is both subject and object, both sentient subject and sensible object—ambiguous. If we pick up a fiddler crab, we can feel it crawling across our hand just as the fiddler crab feels us underneath its legs.

A reconnection with any environment in the natural world can reawaken our senses. The ocean invites this reawakening, which creates a space for an erotic relationship. An erotic relationship with the ocean can further extend to a relationship with other parts of the natural world because of its inherent sensuous qualities. Consider how with the first step on the beach, the ocean captivates the senses. It is almost impossible to notice anything but the ocean: the hot sand slipping between your toes, the sharp shell underfoot, the sea air whipping around you, the scent of sunscreen and the briny sea air, the call of the sea gull, the whistle of the wind and the crash of the wave, the warm sun on your skin, and the taste of salt in the spray. The senses fuse synaesthetically because the ocean demands it. As our senses are rejuvenated, we become open to the ocean-Otherness. This openness allows us to experience the ocean as it is.

We reconnect with our *a-priori* primordial conscious perception and rediscover the ocean through our breathing bodies and flesh. This experience in an erotic relationship with the ocean sparks a deep emotional, physical, and spiritual connection:

The sea holds a magic for those of us who know her. A magic so simple, pure and powerful it works as an unseen force in our souls. We're drawn to her. The spirit

of the sea moves in us as we move within her, undulating folds in pursuit of our peace...we inherently know this to be so. The sea brings comfort, solace, release and escape. The sea brings healing. The spirit of the sea, for some of us, is the very essence of life. (Glendon, 2005, p.70)

Self is embodied as sensual-in-the-flesh experiences are captivated both in the ocean and at the shoreline. The ocean “offers an evocative relationship between our way of being in the world and our particular place in it” (Victorin-Vengerud, 2007, p. 170). In *The Awakening*, Kate Chopin’s character, Edna Pontellier, believes that the sea speaks to her soul. The “seductive” voice of the sea and Pontellier’s lived experiences with the ocean spur an awakening. Pontellier began “to realize her position in the universe as a human being, and to recognize her relations as an individual to the world within and about her” (Chopin, 1993, p. 13). Through an erotic relationship with the ocean, we can accept our situation and strive for our projects. Moreover, we would then be able to recognize the possibilities of the ocean and consider the ocean as a subject, free and worthy of care. This enables us to act in concert alliance with the ocean for its freedom and protection.

How is it possible to ensure that the ocean is protected and respected? Perhaps when we first consider that the ocean is more than the earth’s greatest commons, it is the greatest unifier. Consider how Rachel Carson defends this key point:

Then in my thoughts these shores, so different in their nature and in the inhabitants they support, are made one by the unifying touch of the sea. For the differences I sense in this particular instant of time that is mine are but the differences of the moment, rhythms of the sea. (1955, p. 250)

The ocean touches every continent. The ocean reaches into every continent through the connection with inland water systems. Though nations may be physically, economically, socially, politically, and culturally different, the one thing they share is the shoreline. All people are reliant on the ocean in the same way. The ocean is a source of security, as it provides water, medicine, food, energy, and planetary governance. Though security can be generally associated with negative and dangerous connotations, in the case of the ocean it is our lifeline. When we don't view the ocean as something that sustains and secures us, in turn, we will neither view it as worthy of protection nor will we invest in the security the ocean provides. The needs of the global community must overcome this obstacle, because the ocean is an essential and unifying system that connects us all. The value of the ocean is so great that it has the capability to sustain us far into the future for energy, protein, and water. This can only happen, however, if we grant erotic generosity to the ocean. There are innumerable ways to grant erotic generosity to the ocean—Other, including, for example, cleaning debris in local waterways, reducing our use of oil-based fuels, raising public awareness of marine-related issues, and purchasing seafood that is harvested sustainably or fished locally. Our growing erotic relationship with the ocean yields a mutual reciprocity that is joyfully sustaining. It is easier to develop this type of relationship through intimate experiences with the sea, but how do people without these experiences or exposure to the sea develop erotic relationships with the ocean? I will now discuss this possibility and whether it is necessary for people everywhere to develop a relationship with the ocean.

### **Argument B: Why Marine Science Matters for Everyone, Everywhere**

More than seventy percent of the earth is covered in ocean, which is the source of more than ninety-five percent of this planet's water. Since the beginning of ocean exploration, we have only been able to study approximately five percent of the ocean. We send scientists into outer space looking for sources of water, and yet we have little understanding of the largest source our planet offers. The priorities of the government are evident when considering the budget for marine versus space research. Congress had a \$3.7 trillion budget for fiscal year 2012. Of that money, it awarded \$18.7 billion to the National Aeronautics and Space Administration (NASA) and only \$4.5 billion to the National Oceanic and Atmospheric Administration (NOAA) (H.R. 2596, 2011). Further, the \$4.5 billion was \$1 billion less than what NOAA requested from the government for research. Space research is certainly of great importance, but it is concomitantly important to also try to gain a greater understanding of the planet we live on. One of the major concerns with this unequal focus on marine science research is that our limited marine research forms the basis of what we know about the ocean, fisheries, and resources. In other words, the only knowledge we can use to make decisions for the ocean is based on only exploring five percent of it (U.S. Commission on Ocean Policy, 2004). Worse, the five percent is only that which has been investigated, not even thoroughly understood. An authentic understanding of that five percent cannot occur without a more holistic view of the ocean. In other words, we cannot fully comprehend the five percent of the ocean we have explored without having an understanding of the other ninety-five percent. The priorities of our government need to change, as it is of utmost importance that people worldwide have a better, more authentic understanding of the ocean. Contrary to what our limited understanding may suggest,

Jacques Cousteau argues, “If the oceans of earth should die...it would be the final as well as the greatest catastrophe in the troublous story of man and the other animals and plants with whom man shares this planet” (1975, p. 25). In reality, without the ocean-Other, there would be no life. Marine life, especially the photosynthetic microbes, is responsible for the chemical composition of our atmosphere. Without them, our atmosphere would be largely carbon dioxide, similar to that of Mars. Valdes, Fonseca, and Tedesco (2010) further explain this predicament:

Put into a larger context, more than 1,500 people have climbed Mount Everest, more than 200 have journeyed into space, and 12 have walked on the moon, but only 5 percent of the ocean floor has been investigated and only 2 people have descended and returned in a single dive to the deepest part of the ocean. On the other hand, no part of the ocean remains unaffected by human activities, such as climate change, eutrophication, fishing, habitat destruction, hypoxia, pollution, and species introductions. Therefore, the scientific study of the ocean should an international priority. (p. 173)

Sylvia Earle (2010), a leading American oceanographer, famously asserts that, “for us to have better maps of the moon, Mars, and Jupiter than our own ocean floor is baffling.”

This statement is an apt analogy for the state of marine science knowledge across the country and reflects the significance of its deemphasis in K-12 education as well. The common core Benchmarks of Scientific Literacy (AAAS, 1993, 2009) and the National Science Education Standards (NRC, 1996) only grant token consideration to the ocean-Other. In general, the ocean is reflected in these documents within a few earth science concepts. However, the Standards and Benchmarks neglect to draw important

connections between the ocean and biological or ecological processes. Despite that many students live in noncoastal areas or landlocked states and the content is not reflected in standards-based tests (e.g. NRC, 1996; AAAS, 1993, 2009), an understanding of the ocean is paramount for their lives. The ocean controls weather and climate, is a source of amazing biodiversity, provides food and water, moves ships carrying goods from around the world, and is an important sink for carbon dioxide. Strengthening and implementing marine education in schools is essential, even if our students have never seen or live far from an ocean. Science education provides a prime opportunity to reveal and develop an understanding of the ocean-Other. Further, science education classes may be one of the only places students are exposed to ocean research and challenged to critically assess what it reveals. Further yet, science education provides a platform to experience and understand the ocean relationally within landlocked states. These things are important for a strong understanding of marine and aquatic sciences, and equally important, for landlocked students as it is for coastal dwellers in terms of making appropriate decisions for their community and environment. Let me explain further.

From a practical standpoint, the implementation of a marine education in schools will easily accommodate the many school policymakers' argument that tomorrow's children need a more "rounded" education. Marine education widens a very narrow school curriculum with integrated understandings through *erotic* science education. Rather than promoting disconnections through academic disciplines, marine education advocates a robust integration of history, reading, writing, mathematics, and the natural sciences in order to understand why we rely on the oceans for our very survival and reproduction. For example, consider the integration of disciplines in a lesson on plate

tectonics of ocean basins. As students learn about the layers of the earth and constructive and destructive plate boundaries, they use mathematical knowledge to calculate the rate of plate movement and the age of a location based on its distance from the mid-ocean ridge spreading center and the depth of various points in the Atlantic Ocean. The students learn about history through the events that led to the development of the theory of plate tectonics. They practice writing when journaling about what the earth might look like millions of years in the future. Students gain a better understanding of natural history by investigating how plate tectonics influence the geology of an area, which in turn allowed for the introduction of natural communities, and later, human communities. Marine education is an integrated content for understanding how to apply new knowledge to our prior understandings to learn about the past, present, and future natural conditions. When marine science is taught contextually, it moves beyond practical to an enhanced “lived” curriculum, because it can be used to educate students on ecological sustainability, conservation efforts, and how to help affected human and nonhuman others. Integrating these things can be difficult for educators, but worth time to create integrated marine science curriculum, which enables youth to share responsibility for important community and environment choices. In many ways, marine education embodies the erotic education. To more fully grasp the significance of why marine science matters to everyone, everywhere, I will consider proximity to ocean, the relationship between oceanic and human health, other relational considerations, and the marginalization of marine knowledge and relationships.

#### *Landlocked States and Noncoastal Areas*

*“Even the upper end of the river believes in the ocean.” –William Strafford*

In 1959 the National Academy of Sciences—National Research Council conducted a survey to determine the then current status of marine sciences in the United States. The council concluded that it was necessary for an increase in national effort focusing on theoretical and applied marine science research (National Academy of Sciences—National Research Council, 1959). The committee made recommendations to hasten the advancement of marine science research, including the establishment of new centers for marine science education. They suggested that universities across the United States with a ‘critical mass’ of strong general science faculty tackle this challenge. Kornicker (1961) conducted a study to determine whether the location of the university in coastal or inland states made a difference in the number of students studying marine science or the number of oceanographers produced, concluding that the location did matter where strength of education was the same. Marine science was not taught or researched as much in inland states as in marine coastal states. Though not implicated in the study, it seems reasonable that secondary science classes within the United States would show similar findings even today. In fact, there is very little research and little has been written about the relationship between an inland local and marine science education, particularly at the K-12 level, with the exception of a few studies that demonstrate marine science education is largely deemphasized in noncoastal areas and landlocked states (e.g., Charlier & Charlier, 1971; Madrazo & Hounshell, 1980; Madrazo & Hounshell, 1990). Without a coastline for authentic experiences with the marine environment or the aid of universities for teacher preparation, secondary science teachers feel disadvantaged for the knowledge, skills, and resources necessary to convey this content and these types of erotic experiences to their



students. Further, teachers may not feel motivated to explore ways to integrate marine science content because it is not reflected in the science education standards and there are so many other time and curriculum constraints, withstanding private and charter schools. However, without a better understanding of our oceans, we sink deeper into a situation where science education remains void of teaching youth to challenge the domination of the ocean-Other while terrestrial environments are privileged, and our marine resources become increasingly limited and degraded. If not school then where will youth learn about the condition of the ocean-Other, necessary for assessing and taking action when it becomes degraded? It is essential to implement a marine science curriculum in order to grant freedom to the ocean-Other for the protection and conservation of ocean integrity.

A marine science curriculum is an opportunity for educators to help students move forward toward transcendence through experiences and reflection. In order to gain respect for the marine environment, one must find something common or familiar with it. Experience is a crucial element to gaining this perspective. Rachel Carson (1955) argues that the best way to build a relationship with the ocean is to stand at the water's edge and peer through the water to find the ocean's wisdom. Though this is certainly ideal, it is not the only way to gain wisdom from or experience the ocean. Students in inland areas build an erotic relationship with the ocean by engaging in synaesthetic inquiry experiences such as investigating and understanding the eroticism of their local water systems. Consider the landlocked state of Ohio where I was raised. Ohio's northern border consists largely of Lake Erie, the fourth largest Great Lake and a prime environment for taking advantage of this kind of opportunity. Yet, this important freshwater system is largely neglected in Ohio school curricula. Part of the problem is, as mentioned, many

universities still do not offer marine science or limnology major programs or elective courses, particularly colleges within landlocked states. As a result, teachers have a lack of marine science and the associated erotic pedagogical content knowledge (PCK). If pre-service and in-service teachers are not getting exposure to content knowledge in their degree programs or through professional development, where else will they be prepared to effectively teach marine science content? One might argue that teachers are being prepared to teach marine science in the colleges of arts and sciences, however, I contend that even when this occurs, teachers are not learning the necessary pedagogical aptitude. Teachers develop PCK through teaching and exposure to the content, but it is not always enough to conceptualize the subject matter. Abd-El-Khalick (2006) explains that an important component of PCK is quality experience, and I would add, an erotic endeavor. In general, the amount of years a teacher has been teaching is not as important as the way s/he engages the content. Specifically, Abd-El-Khalick found that teachers who spent time reflecting on subject matter were able to develop a more integrated view of a discipline. This means that a pre-service teacher could potentially have the same PCK as an experienced teacher, depending on the level of expertise on the subject. In this case, expertise is developed through reflection and interaction with the material. Moreover, teachers that had experiences to draw on outside of teaching had a greater impact on a teacher's conception of the subject matter. Teacher preparation programs across the country are constantly striving to develop more meaningful ways to integrate reflection and have science teachers critically assess their own knowledge and teaching. Despite that, if both reflective teaching and physical experience with the content is an important component of PCK development, teachers in inland states will still be ill-prepared to

teach marine science in authentic ways with such a neglect of marine science exposure in teacher preparation programs and universities in general. Let me demonstrate this point.

I became a teaching assistant for the Marine Science department in 2005 when I first entered a doctoral program at the University of Georgia. I was fresh out of an undergraduate program, having majored in Marine Sciences at the University of South Carolina. I had taken two education classes and had done some science tutoring, but I had never formally taught before. I had, however, spent three years working intensively in a marine organic geochemistry research lab, and this experience gave me the confidence to assume teaching sixty undergraduates about marine sciences could not be that difficult. I felt confident in my science content knowledge, but I had no pedagogical knowledge to draw from. It was difficult. I had no idea about classroom (or, in my case, laboratory) management, how to effectively assess my students, or how to explain challenging science concepts in a way that business or art majors could understand. The properties of water, marine chemistry, and marine predator/prey interaction came so easily to me. How could my students not understand? My students spent much of their first few labs socializing, because I was unable to keep order in the lab. They asked questions I was not prepared to answer and were frustrated at some of my responses. This made me frustrated, which made any follow up discussion worse than my initial response. My students said I graded too harshly, and they argued for more points. They realized what a pushover I was. Many times when I left the lab, I was covered in salt water and chemicals from labs gone awry. Other days I had no voice from yelling above my students' conversations, trying in vain to get them to listen to me. They were in college, I thought. Why didn't they listen to me? There were even days when I shut the lab door after the

last student left, sat on the floor, and cried. This experience was not what I wanted or what I thought it would be. In this first semester as a teaching assistant in the Marine Sciences department, I also took a required pedagogy class that was basically geared at teaching graduates in my situation. Everyone in the class had a strong science background, little to no teaching experience, and a one semester teaching requirement for their degree. The professor of the course had helpful strategies, but because I took it simultaneously to teaching, as the rest of the class did, it offered little relief to the difficulties I faced. I could not help but feel I was doing my students an injustice. When I was offered another teaching assistantship in the department for the next semester, I knew I could not walk into that lab another semester without figuring a few things out. I spent many hours talking about pedagogy with my supervisor, pouring over the labs, rewriting quizzes, and even helping my supervisor rewrite some laboratory exercises. I set up and broke down all of the labs, and I taught the new teaching assistants the ropes. When I left the Marine Sciences department after several years as a teaching assistant, I felt so comfortable teaching the content. However, it was not because I repeated the same lessons semester after semester. It was because of the time I spent reflecting on my teaching, engaging in the curriculum, and making connections to my experiences with the ocean. Further, even though I majored with honors in a reputable marine science program, I was developing a more cohesive, conceptual understanding of marine science content through these experiences.

Although it can be difficult to assess a change in PCK in the short amount of time that teachers spend in professional development or teacher preparation, I have witnessed a similar increase in PCK in science teachers at the University of Georgia. Several years

ago I was a teaching assistant for a course “Marine Science for Teachers.” This course is offered at the University of Georgia every summer, but is often cancelled due to low enrollment. My students were a mix of pre-service, novice, and experienced science teachers, and the course lasted an entire summer semester. During the course, the students conducted laboratory exercises in a variety of marine science topics, including marine chemistry, biology, geology, and physics. We also took a four-day field trip to the Gulf coast of Florida to experience the ocean erotically. Throughout the course, my goal was to teach them marine science content while also teaching them how to teach marine science. Though the field trip was optional, I stressed the importance of going to experience teaching in the field. Although it is less feasible for inland, and in many cases coastal, teachers to take their students to the coast, many of the techniques used at the coast can be used in other aquatic environments that may be more practical to access. Although all of students showed some improvement in their PCK, one in particular stands out in my memory. Emily had taught middle grades science for eight years. She had a particular interest in marine science, and took the time to integrate marine life in her life sciences class beyond what the standards required of her. She came to class the first few weeks overly confident and prided herself on trying to best me. Emily told me often in those weeks that she took the class to meet her science requirement only because it was easy. She said she already knew how to teach marine science. Her negative presence was often very difficult to overlook in class. It was evident that her peers were aggravated by her comments, and it sometimes made for a stressful learning environment. Many times after lab I was frustrated and angry with her for not taking the class or me seriously. She was definitely knowledgeable in the content, but her assessments demonstrated a weak

understanding of how to teach marine science. I based the science teachers' assignments largely on my understanding of how my own PCK had improved. I asked them to model assignments they would have their own students do. They drew concept maps, wrote lab reports, and kept a field journal. I also required them to journal about how they would teach the lessons we covered. The teachers made alternative assessments for the content, designed their own quizzes, created rubrics, and so forth. Many of Emily's assignments were superficial and did not challenge her students to think more critically about the content. When I questioned her privately about her effort and her assignments, she made it clear that she thought she knew everything she needed to know already. The class was essentially a waste of her time, and because I was younger, clearly with less public school teaching experience, so she thought I was not a credible instructor. The field trip was more than half way through the summer semester. Much to everyone's surprise, she came. On the first night of the field trip, we took a boat out to trawl for fish and invertebrates. On that boat in the middle of the night in the Gulf of Mexico, her blasé attitude changed. I asked Emily to grab one end of the net to help me pull it out of the water. She grumbled, but obliged. The net was so heavy, we almost could not get it up. Two more teachers got behind us to help us pull. We heard the net tear, but the captain directed us to keep pulling. Finally, we got the whole net onto the ship. It was hard to see by only the light of the moon and one small overhead light, but we heard the sound of tiny claws and little mouths gasping for air. Hundreds of fish and invertebrates spilled out of the net onto the deck, flopping and crawling to the far reaches. It was the largest catch I had ever seen. Many more were stuck in the net, and when my eyes adjusted and noticed, I yelled for the teachers to help me get the organisms out and in buckets before

they died. It was important to separate them by species, particularly because of the aggressive crabs and jellyfish already attacking and paralyzing the others. Emily quickly jumped to the task. She ordered one of her peers to grab her field journal and a pen to record our catch. She began yelling out the name of the organisms she could identify and asked questions about the ones she did not know. Normally very lackadaisical, Emily handled the organisms with such care. It was like a switch went off in her mind. She realized through our field experiences that there was much more to teaching marine science than she had previously thought. For the rest of the field trip and the summer, she was incredibly helpful and invested in her learning. Her final assignment, a complete marine science unit for use in her class, was amazing—thoughtful, meaningful, and personal. I emailed her after the course was over to let her know I had found something she thought she left in Florida. She reflected on the course and her experiences in her reply to me. Her demonstrated drastic improvement of PCK was only more evident in her reflection, and she owed it to the quality of her erotic experiences with the content.

Beyond teachers being insufficiently prepared to teach marine science, many inland state schools focus exclusively on their state priorities. Schools across the nation could emphasize community influences on freshwater systems and how these influences ultimately affect the ocean. Students in Ohio, for example, could consider how their community influences their local water systems and from there, how these impacts are felt along the Illinois and Mississippi Rivers all the way down to where the Great Lakes connect to the ocean at the Gulf of Mexico. The priorities for landlocked states such as Ohio, Minnesota, Iowa and other non-coastal areas of the country are often focused on the agricultural and natural resource priorities within imagined state lines. Although

landlocked states are not in direct contact with oceans, their residents and economic industry have as much right to the coast for economic and recreational purposes as those coastal states. There is also an “equal opportunity” to damage coastal environments regardless of where one decides to exploit them. Every time individuals in landlocked states flush their unused pharmaceuticals down the toilet or dump out the last sip of soda onto the impervious school parking lot, they are allowing waste and potentially dangerous chemicals to enter the oceans just as someone living a mile from the ocean might do. Invasive species are introduced just as easily at the coast through fishing and recreational equipment or aquaculture as through inland release of domestic animals, construction projects, or through live food trade. Both coastal and inland sources of invasive species have potential harmful impacts on the marine environment through outcompeting native species. We carelessly throw plastics into the garbage rather than recycle them, and much of this plastic finds its way to the sea. Plastic debris from both inland and coastal sources travel through the ocean on currents, creating enormous garbage patches in ocean gyres. The plastic is photodegrading into smaller and smaller pieces, where some pieces are small enough for tiny marine organisms to ingest. Then, the plastic bioaccumulates up the food chain at potentially toxic levels. The degradation of US marine systems is the culmination of hundreds of thoughtless actions nationwide, and science teachers are wasting a powerful opportunity to teach about the sea. The energy spent remediating our negative influences could be used to bring attention to what people are putting into their soil, forest, ocean, and body. On the other hand, consider the impact of reducing pharmaceuticals, for example, if people were more proactively



involved in eating healthy, exercising and reducing their stress. These things are directly related to ocean health despite where people live, as I will discuss later.

Many inland students already recognize the importance of the ocean in their lives. They work together in their science classes to build an erotic relationship with the ocean through experience and protection of their local water systems. For example, many science students in the eastern United States use the Basic Observation Buoy (BOB), a smaller student-built buoy, to measure water and atmospheric parameters in protected coastal and inland waters. Students use BOB off the coast of North Carolina, the Great Lakes, the Chesapeake Bay, and various other local inland and coastal water systems extending down the east coast. Adams, Levine, and Spence (2012) explain that BOB is used to measure in real time such water quality parameters as temperature, pH, dissolved oxygen, and conductivity. In addition, some science students are also deploying thin film passive samples to detect organic contaminants, like pesticides and hydrocarbons, in their local waterways. In comparison to coastal water concentrations, this environmental monitoring is used to determine the impact the students' local waterways have on the sea. Another example was revealed in a recent news report, where the science classes of two teachers at Gorham High School in southern Maine are partnering with other schools and collegiate scientists to study the Androscoggin River. This school year, one class will examine mercury pollution downstream of the former chlor-alkali facility, now an EPA Superfund site. The students will work to aid in the understanding of mercury biocaccumulation patterns. The other class is investigating the affects of culverts on stream ecology through student-scientist partnerships (SSP's). The ultimate goal of the project at Gorham High School is for the participating students to "develop a better

understanding of watershed science, local aquatic insects, and chemical pollutants” (Grima, 2012). In both examples, students are increasing their marine and aquatic sciences content knowledge while contributing as citizen scientists by uploading their data to specified web portals for scientists and other students to use. Though their actions may be initially spurred by the erotic relationship their teacher has with the ocean, through their actions, students are fostering their own erotic relationships. The result is generosity (or activism) geared for the protection and conservation of the ocean-Other.

Youth intimately perceive relevant examples of people in their inland community, landlocked state, or cities like their own working out of respect for the sea. Despite that the examples are beyond their own “formal” science education, they are still within the larger realm of education. Further, community examples are often an excellent way for students to get involved personally or with their class. One example of people demonstrating the value of the ocean for everyone, everywhere is from a group students at the University of Washington Bothell. These students designed the Facebook game UWB Wetlands Restoration in order to expose people to the relevance and importance of wetlands despite where they are living. In the game, players “maintain the biological diversity of the wetlands by obtaining up to 30 species of plants...and planting them in areas to support biological diversity in the wetland, all while fending off invasive plants” (Cook, 2012). Gaming is an area of relevance to our students and, if used appropriately, can be a prime teaching opportunity. In this case, this Farmville-esque game allows inland students to explore a marine ecosystem and understand biodiversity. It teaches restoration and succession in addition to donating a portion of any proceeds to actual wetlands restoration. Another example can be found in the recent inclusion of Iowa

farmers in the Gulf of Mexico Alliance (Ocean Frontiers, 2012). Iowa agriculture is an artificial, monoculture landscape that produces 23 million acres of row crops for food and energy each year. Nutrients from the production of these crops make their way into the Mississippi River, adding to the 200 million gallons of water that drain yearly from inland states to the Gulf Mexico. The nutrients that flow from the crop fields into the Gulf of Mexico have an enormous impact. They are responsible for harmful algal blooms, which deplete oxygen in the water, and create dead zones each summer off the coast of Texas and Louisiana the size of Massachusetts. These dead zones essentially suffocate all life within its reach. The Gulf of Mexico Alliance was created by the governors of the five states boarding the Gulf in an attempt to preserve the Gulf for their economic future. They wanted a more regional influence; considering the fish and shrimp swimming in the Gulf of Mexico know no state lines. However, the Gulf of Mexico Alliance wanted to include stakeholders from states beyond the coast that also impact the Gulf of Mexico. Consider a program where farmers from Iowa take a bus from their farms in Iowa, down along the Mississippi River to the delta, where it meets the Gulf, in order to experience erotically how their farming practices affect the ocean. The farmers go fishing and spent time on the ocean. Their perception changes during that trip, when many of them realize the impact that they have on water so far from their farms. The Iowan farmers agree to reduce the amount of fertilizer they use each year through an agreement that if their crop yield is low, they will be repaid the damages. The farmers are now more than a year away from this experience, and discover that drastically reducing fertilizer does not reduce their crop yield. Because of their erotic relationships, the farmers are able to protect their finances and the environment through the erotic

generosity of actions that matter. Other farmers agree to build organic filters, or nutrient reduction wetlands, below their farming watershed to reduce the amount of nitrogen runoff. After the first year, many farmers see a 40-70% reduction of nitrogen runoff because of the artificial wetlands. A final action Iowan farmers take is planting strips of native tall grass prairie as a riparian buffer. After the first year, these test strips show an 85-90% reduction of nutrient runoff and created a new wildlife habitat. These examples from the community are valuable exposure for students, as they have the power to demonstrate for inland students that the ocean is important and their actions make a difference. The erotic generosity of these farmers is virulent for others.

Gaining a better understanding of the ocean as worthy of freedom and respect establishes the foundation for an erotic relationship with the sea. As evidenced in these few examples, experiencing the ocean in this way, although not necessarily being present in a marine environment, teaches students how to treat the ocean respectfully so as to fulfill our obligation of conservation in the form of mindfully erotic generosity.

### *Embodied Generosities*

For many students, the ocean is hundreds of miles away, but their body is ever present. Students are conscious of the health of their bodies, but do they understand the health of the world's oceans? The health of the marine environment has been emphasized more recently in popular media and scientific reports, such as the 2001 International Panel on Climate Change, and poses a very relevant topic for students for the sake of the ocean and in connection with their own bodies. Knap et al. (2002) explain that a regional or global understanding of ocean health generally considers the maintenance of biodiversity

and the integrity of marine communities. Typically, scientists consider the changes to community structure and measures of chemical contamination to get an idea of the health of the ocean. The authors explain that a healthy ocean is vital to determine the limit humans have on the genetic richness of the living resources, how well we can protect critical ocean habitats, and our ability to safeguard human health. It is not always easy for youth to gaze at the surface of the ocean and determine if it is healthy or not. Environmental toxins in the water are mostly invisible. Red tides and harmful algal blooms are visible, but many students are unaware of what they are or the dangers associated with them. It is essential for students to have an understanding of ocean health, and yet marine science education is nearly void in many US public school classrooms. How do educators interested in marine education raise ocean wellness to the status afforded our bodies? Given the time that students spend getting ready for school brushing their hair and teeth, painting their nails, putting on makeup, eating breakfast, and selecting the right clothes for the weather, the body is very important to students. But how many young people associate what they eat for dinner, the supplements or medicine they take for wellness, or their family's livelihood or traditions with the sea? Perhaps in light of the increasing attention on ocean health, teachers, administrators and legislators can and should advocate more fully for integrating marine education. After all, it is easy to integrate in traditional science curriculum because there is a powerful link between healthy human bodies and the Earth's oceans (Luther & Mueller, 2011).

The photosynthetic marine organisms that helped to create our unique atmosphere are responsible for seventy percent of the oxygen we breathe. The vast expanse of ocean water these phototrophs live in plays an essential role in the water cycle, recycling the

freshwater we drink, which in turn contributes to the approximately seventy percent of water that composes an adult human body. The connection runs deeper with the abiogenetic genesis of life in the ocean 350 million years ago. Though today we are not formed in true ocean water, the amniotic fluid of our mother's womb indeed resembles the salinity of an estuary, the nursery of many marine organisms. In fact, the saline composition of land animals is "carried with them a part of the sea in their bodies, a heritage which they passed on to their children and which even today links each land animal with its origin in the ancient sea" (Carson, 1955, p. 13). The embryonic development of humans mimics their evolutionary development, from water-dwelling water organism to one who can exist only on land. The proportion of potassium, sodium, and calcium in our bloodstream resembles that which flows through the ocean. The calcium carbonate found in reefs and coral, created by the collection of cast away shells and exoskeletons and home and protection to mollusks, fish, and numerous other ocean organisms is similar to our lime-hardened bones, used to protect and support our bodies. Although my focus in marine science eventually evolved from marine biology to marine geochemistry, I remained intensely interested in the health of coral reefs. I know that without a healthy reef population somewhere in the world, I would not have my own health to be thankful for. People with intimate experiences with the ocean often instinctively associate the good health of their bodies with healthy oceans.

There is some pertinent scientific evidence to ground this relationship. There are two major theories of the psychophysiological effect that nature has on humans. The first is Kaplans' (1995) attention restoration theory, which considers mental fatigue. Children can experience mental fatigue quite easily because of the increasing pressure put on them

to perform: making sure they study, completing assignments, taking standardized tests, all while trying to be social creatures and deal with distractions and their own personal inner dialogue. When a child experiences mental fatigue, they have lowered competence and functioning efficiency and suffer from attention depletion. Exposure to a soothing natural environment, like the ocean, can restore attention depletion. The second theory is Ulrich's (1983) psychological-evolutionary theory, which focuses on the reduction of stress through exposure to a natural environment. When children undergo a stressful situation, it may disrupt the natural equilibrium of the body, creating a constant fatigue. Because natural environments have the ability to invoke feelings of pleasure and calmness, they have been demonstrated to be very conducive to reducing stress (Han, 2009). Although dissident theories, they share what is known in the evolutionary theory proposed by some eco- and evolutionary psychologists, which suggests that humans are born with an innate emotional attachment and attraction to the natural environment due to a genetic-encoding tracing back to the beginning of man and the days of hunter and gatherer (Han, 2010). As a result, wilderness and natural areas like the ocean provide many psychological and physiological benefits, such as stress reduction, and proving a general feeling of well-being. For example, a recent study indicated that people living near the coast are healthier than those living inland. Moreover, among coastal residents, more impoverished communities showed a higher level of health compared to those more economically privileged (Wheeler, White, Stahl-Timmins, & Depledge, 2012). The authors indicate that this association between good human health and the ocean might be a result of the ocean's ability to reduce stress and the opportunities present at the ocean for increased physical activity. Moreover, interaction with the ocean or other aquatic

environments can improve information recollection, problem solving, and creativity. It encourages the development and fostering of imagination and the sense of wonder, which is an important motivator for life-long learning. Exposure to the ocean or other aquatic environments can increase directed attention in children (Faber Taylor, Kuo, and Sullivan, 2002), combating fatigue and reduced performance. When teachers provide these erotic opportunities, they provide students with the means to develop important skills, which will help them better function as an adult. In addition to learning important safety skills, building social relationships, enhancing their cognitive performance, and improving creative thinking, students “grow emotionally and academically by developing an appreciation for the environment, participating in imaginative play, developing initiative, and acquiring an understanding of basic academic concepts” (Clements, 2004, p. 68). Interaction with an aquatic environment can increase confidence, improve decision-making skills, and decrease psychological distress (Faber Taylor and Kuo, 2006). These synaesthetic qualities create a prime environment for practicing mindfulness meditation, which reduces stress, ruminative thinking and trait anxiety, and increases empathy and self-compassion (Chiesa & Serretti, 2009). The connections between increased health and the ocean abound, and it follows that the enhanced mindfulness and embodiment is highly plausible in ecosystems surrounded by mountains, forests, streams, lakes, or prairie—the key point being the highly erotic Other.

When my grandmother became sick with stage 4 liver cancer last year, she asked to be taken to her and my grandfather’s beach house in New Jersey. They typically spend the cold winter months in Florida, and she learned her prognosis in October. They had only just moved back to Florida from their house in New Jersey a month prior when she



went to her doctor for hip pain. In not being able to detect the source of the pain, the doctor sent her for more tests. The tests revealed the tumor growing on her lungs, which had formed from cancer cells originating in her liver. Her prognosis was grim without treatment—the doctors predicted she would live maybe two months. She opted for chemotherapy and radiation, which tied her to their house in Florida. Yet, she continued to ask when she could go back to their house in New Jersey. She did not care how cold it was, she only wanted to be at her place of solace. Months later, she completed her treatment. Her PET scan revealed that the tumor had actually grown despite the intervention. The doctors finally gave her permission to travel. In Florida, my grandma was very tired but still active. She resumed many of her daily activities. When she got to New Jersey, she became increasingly more tired. Many days she slept more than she was awake. My grandma had decided against any further treatment. My family knew her disease was terminal. Considering her prognosis before treatment, when her tumor was smaller, we began to worry that she would not live to check events off her list of things she wanted to be alive for: the birth of my brother's baby, the second child born to my cousin, another cousin marrying. She took walks to the bay with the aid of my uncle. My grandpa drove her to the lighthouse just five miles away. Then she slept for a few days, waking only when her children asked her to. Our worry increased. Then, amazingly, she spent more time awake with each day. Before long, she was sitting at the table for dinner and walking without her walker, then with only a cane. She was able to check each item off her bucket list, and the seasons changed. Her body needed rest for healing, and the ocean granted a soothing, peaceful environment for an ultimate restful experience. My grandma is still doing well, one year after her initial diagnosis. There are places of

healing on various beaches around the world—the purpose is to allow those that go a place to stay to let the ocean do the natural healing. Consider places that exist to allow children to interact with various aspects of the ocean to heal from emotional traumas. This begs the question as to whether the association between good health and the ocean holds for a garbage-strewn, polluted beach? Certainly not a beach tormented by oil slicks!

It is difficult to argue, therefore, against the incorporation of an erotic ethic for the ocean-Other in science education, particularly as it relates to the connection between the human body and the sea. Students are constantly learning about the possibilities of their bodies. Infants learn cause and effect with their bodies, when standing for the first time results in a ‘topple’ to the floor. Toddlers become cognizant of bladder control through the potty-learning process. Children skin their knees playing and over days watch as their blood cells harden and flake, leaving new fresh skin underneath. These are all erotic learning experiences that are given little or superficial thought. As children become teenagers, their bodies change. They are strange and different than the bodies of their childhood, which creates an opening to position their bodies as an Other. Many teenagers overanalyze their bodies, driven by hormones and peer pressure. Teenagers seek out ways to control and understand this body-as-Other. Some experiment with drinking and drugs, drive recklessly, and engage in unprotected sex or dangerous relationships. Others cover their bodies in chemicals through make up and too much cologne or body spray. Many do not get enough sleep and eat poorly. Cohn et al. (1995) explain that teenagers do not always intentionally engage in risky behavior, particularly at the expense of their health. When teenagers are aware of the degree of dangers associated with certain actions, they are more likely to take the appropriate precautions to protect themselves and their health.

We know that in order for students to achieve their own transcendence, they must work for the freedom of the Other. If their bodies are an Other, and the ocean can bring health, it seems logical that the students should take advantage of this connection. Likewise, as students grow to understand that their bodies are not an Other, they will work for the freedom and health of the ocean-Other to propel their projects into the future to achieve transcendence. Drawing this connection between healthy bodies and minds and healthy oceans enables teachers to promote erotic generosities to the bodies of their students and the ocean. Students are able to use their experiences and understandings of the ocean to give of themselves for the protection and conservation of the ocean. Further, students recognize that healthy oceans are vital to their eroticism and health of their bodies.

### *The Marginalization of Knowledge*

Just a few weeks before my spinal fusion, my mom came in my room and told me to pack a suitcase. She had made arrangements for my brothers to stay with my dad, and she wanted to take me to my grandparent's beach house in New Jersey. At just fifteen, I did not understand what was going to happen to my body during that surgery. I did not have the scientific background to understand the procedure, but I had also never had any kind of surgery before. I was scared. Would it hurt? How long would it take for me to recover? Would I be able to walk? What if something happened? Would my scar be noticeable? Would I be different? I had so much anxiety that some days it felt almost crippling. My mom knew, as moms do. I am sure it was obvious to anyone around me, but she understood what I needed to cope. I needed to get away. More than that, I needed to go

somewhere that has always had the ability to calm me down and give me a new perspective—the ocean.

Children are instinctively drawn to the marine environment and compelled to develop eroticism through an erotic relationship with the ocean, possibly because of a genetic predisposition, but largely because of the innate emotional attachment they have with it. The ocean has the power to draw people to it and to each other, because of its synaesthetic qualities that produce feelings of well-being. Though the ocean beckons us, we can get so bogged down in and distracted by the commotion of our lives, that we often do not hear the siren call. The ocean encourages growing erotic relationships. When we accept its call and strive for the freedom of Others, we are often able to return to the basic intimate relationships we have with Others, our family, and community. In turn, these relationships help us embrace marginalized knowledge that can bring us back from the business of our lives to our primal relationship with the ocean. Gee (1996) explains that the knowledge we learn from home is considered primary domain discourse. *Discourse*, in general, is the “ways of being in the world, or forms of life which integrate words, acts, values, beliefs, attitudes, and social identities, as well as gestures, glances, body positions, and clothes” (Gee, 1996, p. 127). What schools and society teach is beyond, and often times very different from, what students learn at home, and is called secondary domain discourse. Although it is termed secondary, socialization outside of the home in many cases becomes an enlarged sphere of influence. Secondary domain discourse is then given a higher priority, thus marginalizing the knowledge of home and community.

If we favor western science dominated by white males included in this secondary domain discourse, over other forms of erotic knowledge, ways of learning, or practice by

marginalized groups, we ‘silence’ the people who are in those groups traditionally considered to not be able to understand or practice science (Southerland, 2000). In consideration of the erotic ethic, when students assume their ambiguity to become open to traditionally marginalized groups, they may avoid silencing them and embrace their own marginalized knowledge. The Merito Program out of the Monterey Bay National Marine Sanctuary has been working with science classrooms in the local area on the notion of storytelling to give a voice to marginalized groups, including the ocean-Other and their own marginalized knowledge (Youth Ocean Stories, 2012). The Program provides in-class opportunities for students to experience the ocean, including trips to the beach and exploring the Monterey Bay Aquarium. The students use digital storytelling in combination with their experiences and content knowledge to explain valuable and sometimes disregarded marine content knowledge. As students developed an erotic relationship with the ocean through their personal experiences, they were open to the marginalized Other(s) and understood their responsibility to its freedom. In their stories, the students compel listeners to act for the ocean-Other, and these become their erotic, embodied generosities. These become generous acts for a heightened attention to the sea.

The use of certain marine invertebrates for medicinal purposes, sailing by the stars, collecting shells, and using birds, predators and other telltale signs to know the best times to fish or when to leave populations alone are among countless ways that people know about the ocean that do not fall within the generally accepted guidelines of science. Further, these examples are all personal and valuable ways for people to understand the ocean in a way that makes them stand up for the rights of the ocean and their interests and relationships with it. Through these kinds of examples, students become empowered to

learn marine science content, particularly as these things play an important role in how youth perceive science and study their own natural world (Longino, 1990). This is science. The inclusion of that which is not traditionally considered scientific knowledge also helps students to make important and meaningful connections. Says, Derek Hodson:

[P]eople faced with making important decisions in everyday life may not always use 'pure' scientific knowledge. They may use restricted or adapted scientific meanings; they may incorporate knowledge from areas outside science; they may rely heavily on hunch, intuition, personal experience and testimony from other non-scientists. This complex of knowledge is assembled into highly personal and context-specific repertoire for thinking about issues, solving problems and reaching decisions. (2011, p. 44)

As students engage in activities that explore some of the examples above or others to gain a broader perspective of how marine science is important and influential in the lives of others, they gain a better respect for the marine environment. Mastering discourse allows teachers and science students to return to their communities for the sake of the sea. Through discourse, students learn to act and interact appropriately with various texts in order to communicate and participate within the content-specific community (Wenger, 1998, p. 127). Consider a group of high school science students in New York who are working with their teacher and scientists at the University of Buffalo to test pharmaceutical contamination in local waterways (Hsu, 2012). The students work with their teacher to develop their content knowledge and engage in discourse to establish research questions and methodology. The students are particularly interested in trends of pharmaceutical chemicals associated with flu season. As they developed a relationship

with the local waterways, the students realize the impact that personal healthcare and hygiene products have on the health of the water system. They test water from fountains in their schools, wastewater treatment plants, and local rivers to try to find evidence to report back to the community. Through scientific discourse, the students and their teachers assumed a scientifically literate eroticism (way of being). The mastery of this epistemology allowed them to recognize themselves as a knowledgeable member of the community regarding aquatic ecosystems. Mastery of this literacy/epistémé, then, grants teachers and students the type of skills necessary to act for ecojustice within their community.

One reason students are able to act for ecojustice is because discourse and authentic activities challenge them and make them aware of what they think regarding certain issues and their own epistemology. People in general are blinded by myths and presuppositions (Esteva & Prakash, 1998), including the students in our classrooms. When they engage in these challenging, reflective opportunities, the myths and presuppositions fall apart and cease to exist anymore as myths and presuppositions. There are many myths associated with the sea. Consider the pervasive myth that the ocean is so vast, it is basically impossible to deplete its resources (Eilperin, 2006). Many people believe this idea and proclaim, that fish populations will always rebound naturally. As students participate in ocean-related activities and discourse, they reflect on their experiences and begin to understand that this idea is misaligned. Students are capable of acting to rectify the fisheries management issues, for example, and can determine how to act to be most effective for their cause.

Erotic discourse can help students to distinguish between the memory of a community and their own individual memory, which is an important component of recognizing marginalized knowledge. Esteva and Prakash (1998) explain that there are two types of memory: the memory of a storyteller, which keeps the community alive, and the memory of an individual, which liberates the individual from their community. Individual, abstract memory tends to ignore senses, such as taste and scent, which makes it hard to have precise memories of events because they separate what actually occurred. The memory of storytellers can maintain community and cultural memories with the power of spoken and lived words. Community Elders are a valuable asset to the community with regards to knowledge of the natural world, including marginalized ocean knowledge. They often hold wisdom about the ocean that has been passed down to them over thousands of years intergenerationally and formed through their own experiences. They hold a history of the ocean in their stories that can be essential in developing an erotic relationship with the ocean and in understanding and respecting the ocean in a way that promotes conservation and protection. This wisdom is their project. To achieve transcendence, it is their responsibility to their community and the ocean Other to bestow this wisdom such that younger citizens are informed and can engage in good decision-making for the betterment of their community and ultimately, the ocean environment.

Much of what I learned about the ocean and aquatic environments when I was a child came from elders in my family. Many of these experiences help mold the erotic relationships I developed with the ocean. When I was in elementary school my grandpa took me out into the marsh and taught me how to sex a blue crab and how to determine the difference between juvenile crabs, sponge crabs, and soft shell crabs. My parents had



always taken us crabbing in the summers when we were in New Jersey. Because my mom felt uncomfortable taking my grandparent's boat out, we usually crabbbed from the boat dock or in the marsh at the bay. Every now and then my grandpa would come with us. It was always very exciting, particularly because we never knew when it would happen. We would be sitting around a table outside talking and playing, and Grandpa would walk out of the house and say, "Get the gear, I will meet you at the boat." No other words. Just like that, we were going crabbing. He would stroll down the street to the dock while we scrambled to get everything ready. His spontaneity was electrical. The rush to get ready was anxiety-inducing. Grandpa was not someone to disappoint or keep waiting. When we finally made it to the dock, my grandpa was always on the boat looking out into the water. He'd turn and smile, and we were quickly on our way. He always took us to a 'secret' hotspot, which was really just an abandoned dock a few miles offshore. My mom and some of my brothers would stay on the boat and crab off the side. My grandpa got off the boat and walked up the dock into the marsh. My younger brother and I always followed. The dock boards were rickety and untrustworthy. The marsh grass was tall and thick, and green flies circled and pounced. Within twenty steps we were on flat, muddy marsh, ready to crab. One day in particular I slowly pulled my line in and felt the familiar tug of a blue crab. I yelled, "Crab!" and my brother ran over to net it. Grandpa strolled over, saw the crab in the net, and said, "Good boy, Joey!" My brother tried to shake the crab into our bucket, but it was stuck in the net. Grandpa took the net from him, and Joe returned to his line. Grandpa grabbed the crab from behind and wiggled it ever so gently until it was free. He asked me if I wanted to hold it. I had never held a crab before. I had experienced the painful pinch of a blue crab claw in the ocean, so holding one at that

moment did not sound appealing. He gestured for me to take it anyway. He guided me to hold it just as he had, and then he let go of the crab. I was holding a blue crab! As I turned the crab over in my hand to get a better look at it, my grandpa explained the reproductive cycle of crabs and how important the marsh is in that process. On that day, I began to understand the value of a healthy marsh ecosystem.

My uncle taught me about various fish in the lake behind his house in South Carolina. One weekend in particular during my first year of college, I was feeling homesick and needed to be near family. He and my aunt lived just thirty minutes from my dorm, so my cousin picked me up and drove me to their house. It was a hot day, approaching summer quickly. My cousins and I walked down to the lake and jumped in. My aunt and uncle joined us minutes later and sat on the dock. I was treading water a few feet from the boat dock when something brushed against my leg. Despite being fairly knowledgeable about aquatic environments, there is nothing more startling than an unknown entity touching you without your permission. In fact, this was something I have always struggled with as a marine scientist and possibly played some part in why I eventually turned to marine geochemistry—although I am interested in and know about large bodies of water, I am terrified of the unknown. To this day I still have to coax myself into large bodies of water when the visibility is low and I am not familiar with the local ecosystem. But then, when I felt the brush against my leg, I immediately panicked. I started swimming toward the dock, and my family all turned to watch me. I climbed out of the water and started laughing. What was I doing? Everyone just looked at me as I gasped for air, laughing, and I explained what had happened. My uncle asked me to describe it, and I said that it had felt long, pointy, and hard. He said that longnose gar

lived in the lake, and that is what it probably was. I had never heard of a longnose gar, so I just dismissed it and got back in the water. Later that night, I pulled out my laptop and looked up the gar. Had I known in that earlier moment what a longnose gar was, I probably would not have gone back in. The gar did not bother me again, but its long row of sharp teeth would have been a deterrent. Later, my uncle told me what he knew about the gar and other fish in the lake. To this day, I remember the incident with the gar when I am apprehensive about doing something unfamiliar. If I had known about the gar, I would have stayed on the dock. But my ignorance granted me more time in the lake without negative repercussions. Other times he took me out on his boat to the islands in the middle of Lake Murray. Sometimes we would get out, other times we just drifted by. He told me the names of the islands and how they got them. Bomb Island, or Doolittle Island, was named for the Doolittle Raid crew that practiced bombing runs on the island in 1942. Bomb fragments still litter the island, now a bird sanctuary for mostly Purple Martins. Goat Island actually has goats, and the electric company privately owns Pine Island. For several years while I was in college, the lake cove he lives on suffered from drought and rebuilding of the lake dam. An entirely new habitat formed when the water level dipped. My uncle explained how the lake is impacted from drought and weather change. We discussed the role humans played in this situation, and I became a little more conscious of my own water consumption.

Everything I ever learned about Lake Erie growing up was taught to me by my father, not in school despite living only an hour away from it. We would walk down to the beach and sort through the stones, smoothed over time, to find the perfect skipping stones. He pointed out old industrial buildings and told me about the lake economy that

supports many people in Ohio. He explained that the jetties were no longer working to keep beaches in place, and many places were opting to install sea walls in hopes of maintaining their land. One night last summer, long after the sun had set, he asked me to take a walk with him down to the beach. It was so dark, I almost could not see the path, but overhead millions of stars blazed in the sky. It had stormed that day and a few days prior.



Figure 5: Elders have a responsibility to their project and the ocean-Other

Considering the storms and the predicted height of the tides, he knew that the waves were going to be high. I stood on the cement slab that served as an old jetty and watched the lake fling water six feet in the air. I had never seen the lake so rough. I stood there, next to my dad, watching the water leap toward the shore, the wind viciously whipping around us, chilling us. We were yelling just to communicate over the sound of the wind and waves. Though I had never seen the lake so beautiful and magical, I could not shake the fear growing inside of me. The lake seemed angry, as if I walked any closer, it would snatch me from the shore and drag me out, never to be seen again. I felt silly as we turned to walk up the path, when the hairs rose on the back of my neck at the thought of having

my unguarded back to the lake. Although I know the size of the Great Lakes and that they are in many ways like freshwater oceans, I had never considered them as powerful or amazing as the ocean until that night.

On Sapelo Island, Georgia, there is a small community of Geechee people that have lived there for more than two centuries, whose ancestors were brought to Sapelo Island as slaves. They are the largest community of saltwater Geechees in the United States with approximately fifty residents. Sapelo Island is a relatively undeveloped barrier island off the coast of Georgia and is only reachable by boat. The community has only recently felt pressure to adapt to the culture of the mainland residents, particularly as their children are acculturated through mainland public schools and country taxes rise, threatening their ability to keep their property. There is only a handful of elders left on Sapelo Island that have a wealth of generational and cultural marine science knowledge. When you engage them in conversation, they readily tell you all about catches, what they are used for in the community, and how it has shaped their culture. The elders also lead a traditional seining each year, followed by a community cook out each Memorial Day, to maintain traditions and a connectedness to their culture. The knowledge demonstrated in these examples is powerful and can hold the secrets to maintaining a healthy relationship with the ocean. We live in a unique time now, where our elders grew up before the boom of technology. They did not have the Internet, but instead had party lines for telephones, and radios or black and white television with limited channels for entertainment. A majority of their time as youth was spent outdoors exploring the neighborhood and their natural environment. This exploration afforded eroticism as they cultivated a erotic relationship with the ocean. Because the elders in our community have knowledge gained

through the trials and errors of experience and the stories from their own elders, they have a perspective that is linked inextricably with the environment and their community. They are able to explain through vivid storytelling how the ocean environment and our relationship with it has changed over time (i.e., evolving eroticism). When youth engage with elders in their community to learn about the ocean or their local aquatic environments, they are learning the ancient knowledge of the ocean. Through storytelling, elders pass down a skill that promotes relationships and can break down myths. Students can begin to understand the importance of storytelling in their own lives, and that through the ability to tell a convincing story, students can more effectively argue for their cause.

### *Mothering and the Ocean*

Rachel Carson credits her work and passion for environmental and social awareness and justice to her mother, her role model that taught her through experiences in the environment how to act as both a scientist and a civic agent. As I think back to how my own erotic relationship with the ocean developed over time, many of my own memories include my mother. She taught me how to catch blue crabs and brought me whale watching in Hawaii. She was on the shore of a quarry in Ohio watching as I took my first open dive for my scuba certification. Moments later, she calmed me and encouraged me as I became overwhelmed by the experience of breathing underwater in a natural environment for the first time. More importantly, she granted me free play with the ocean and other aquatic environments when I was just a child. I spent hours playing in the creek beside our house, catching crayfish and watching the water flow. Under her watchful eye,

I was able to play freely in the ocean and on the beach. To ensure my safety, she taught me mechanics of waves and the importance of undertow and long shore drift. I dug for sand fleas and watched sea gulls by her side. With her, I walked the beach collecting seashells. This is when I learned the difference between various mollusk shells. As I've grown, she continues to encourage these experiences. Her erotic relationship with the ocean has served as a model for my own, but too has her intimate relationship with me. And now that I am a mother, I instinctively seek these things for my children.



Figure 6: Mothers teach generosity to Other

Mothering is erotic. We learn from the intimate relationship mothers have with their children which mimics an erotic relationship I am arguing for the ocean-Other. Though I have mentioned the negative ramifications of feminizing the ocean, there are some similarities between our human mothers and the ocean that allow children to see that the intimate relationship we have with our mothers can be developed and grow with the ocean. We are drawn to the ocean for comfort and support, just as children of all ages find the same in their mother. Both provide a source of nourishment to those that depend

on it. The ocean and mothers offer protection and security, are gentle and kind, but are occasionally harsh. When we are sick or in need, both the ocean and mothers provide for our nurturance. Mothers like oceans are life-granting. The ocean is shaped and shapes various geological structures, molded by the hands of time, and carrying in them an ancient wisdom. Mothers too are molded through the experiences of their lifetime, and able to work through often-difficult experiences and memories to convey wisdom to their children. Like the ocean, mothers search from their inner core to find the energy to continue, despite how run down they can become. This erotic relationship between mother and child teaches children about realizing and achieving their own potential and engaging in ethical decision making. As mothers act with erotic generosities to find and express love, care for Others, and seek freedom for Others, she models the type of erotic relationship children can have with Others, including the ocean Other. To be generous, however, is to liberally give to others something of value. Though all generosity is out of love or respect for the Other, it does not necessarily mean that being generous is a warm, calm act. To ensure our safety and potential, mothers are tough and uncompromising. Through these actions, mothers teach us too that we must be tough and uncompromising for the safety and potential of that which we love. The ocean is also tough and uncompromising, crashing and storming, expressing its own ability to survive and carry on, despite our actions against it. Through the example of the ocean and enduring tough love, we learn to cope and survive on our own. Like our mothers, the ocean teaches and tests us with rigorous tasks and sometimes challenging conditions, which forces us to endure events and experiences that seem almost insurmountable. They expect us to work to our potential and won't settle for less, even if we don't realize our own potential. In



these lessons, we learn that we can do more than survive—we can prosper and successfully navigate the waters of life. While it might be argued that I am idealizing or romanticizing motherhood here, it is important to recall that my definition of motherhood from chapter three is specific to erotic relationships with children based on the mother's desire to protect her children's freedom and teach them to live ethically. The experiences with our mother and the ocean promote an understanding that because the ocean has protected and nurtured us since the beginning of time, we too should protect and respect it. Our mothers teach through our relationships with them the values needed to maintain a healthy relationship with the ocean. In turn, youth transcend through this experience and take on the role of the teacher, where they inspire others and pass on knowledge about the generosities of an erotic mothering relationship with the ocean.

Consider the science teacher in a high school in south Alabama that turned his classroom into an aquatic learning public facility (Chesser, 2012). He takes his students on a field trip to the Gulf of Mexico and spends time helping them develop an erotic relationship with the sea. He teaches them content knowledge and the value of the ocean. See, teachers have been delegated the responsibility to care for children like their own, and they are legally obligated to care for children in this way, expected by our society. Back in their classroom, the students utilize the facility for their own marine research. However, the students also serve as managers and leaders in the public facility to guide and teach the more than 300 elementary students and their teachers in marine science. Students demonstrate mutual reciprocity through their actions and the erotic mothering relationships they form with Others, where they acknowledge and work for repaying the generosity the ocean gives to us. Through this perspective, students become mothers too.

### **Argument C: Phenomenology of Place in Science Education**

*By acknowledging such links between the inner, psychological world and the perceptual terrain that surrounds us, we begin to turn inside-out, loosening the psyche from its confinement within a strictly human sphere, freeing sentience to return to the sensible world that contains us. Intelligence is no longer ours alone but is a property of the earth; we are in it, of it, immersed in its depths.* (Abram, 1996, p. 262)

It'd be easy to blame the ignorance of my youth for my inability to grasp the eroticism of the ocean prior to my surgery. Indeed many educators, parents, policy makers, and various other ocean stakeholders discount youth for their presumed ignorance or inexperience when it comes to making decisions and acting for the ocean. Although perhaps our students do not have the content knowledge necessary, particularly considering the lack of marine science education in schools, youth are actually very in tune to the synaesthetic qualities of the ocean that can foster erotic relationships. Recall Merleau-Ponty's (1964b) plea to return to our pre-conceptual perception and experiences of a child. These experiences are unadulterated, formed through wonder and imagination, fostered through child-like creativity, and capture the essences of the world. In order to effectively anchor an erotic ethic in science education, we need to get back to the consciousness of a child through a *phenomenology of place*, which would allow our students to view the world, our environments, and the ocean for what it is at its most basic, primal level—taking them back to the phenomena itself. If we encourage students to engage their senses and explore the sensuality of things around them (e.g., the ocean), they would be able to make mindful meaning of the things they are experiencing and

perceiving. In making meaning of the phenomena, students would be able to determine what value the phenomena has and whether it is worthy of the effort to sustain and conserve. David Abram describes the importance of phenomenology of place:

If I say that I live in the “United States” or in “Canada,” in “British Colombia” or in “New Mexico,” I situate myself within a purely human set of coordinates. I say little or nothing about the earthly place that I inhabit, but simply establish my temporary location within a shifting matrix of political, economic, and civilizational forces struggling to maintain themselves, today, largely at the expense of the animate earth. The greater danger is that I, and many other good persons, may come to believe that our breathing bodies really inhabit these abstractions, and that we will lend our lives more to consolidating, defending, or bewailing the fate of these ephemeral entities than to nurturing and defending the actual places that physically sustain us. (1996, p. 267)

Many people rush out to obtain the latest electronic tablet, cell phone, or gaming system, find comfort in retail shopping, and feel most secure in houses with too many rooms and guarded by a white picket fence. In reality, and this is what Abram argues, we are nourished and protected by our natural environments. A consumer-driven lifestyle dulls our senses to perceiving nature as it is, pushing it to the background. There are some that recognize the power of the ocean, as evidenced by surfers on their boards before the sun has even begun to warm the water, pilgrimages to holy waters or use of water in spiritual rituals, and children crowding the beaches on sunny days in impoverished villages around the world. Through experiences and the development of an erotic relationship with the ocean, we can see the ocean at its most basic level. Through this childlike perception, we

can enjoy renewal, healing, solace, and support. Only then can we understand that the ocean is a source of connection and continuity. Only then can we recognize the value of the ocean and our responsibility to protect and conserve its resources and the natural ocean environment.

We are living in a time of major social, political, and economic changes. Our knowledge and ways of understanding changes too with changes in time and space that comes with growing technological advances, globalization, and the subsequent generation and organization of information. “Scientific literacy is essential in helping students to cope with life in this constantly changing and uncertain world” (Hodson, 2011, p. 6). Ocean literacy is essential in helping students to tackle constantly evolving and changing ocean-related issues and understandings for the health of themselves, their community, and the ocean. It challenges students to be more conscious consumers of knowledge, but what about material goods and services, particularly those that affect the health of the ocean?

Hundreds of millions of dollars were spent in the 1970s and 1980s on the deep-sea mining of manganese nodules. The feat promised so much economically that the Law of the Sea negotiations in the 1980s was stalled to determine which country was worthy of claiming such reward. None wanted to give up the potential capital. The Law of the Sea Treaty of 1994 later included policies to protect against deep-sea mining, but the wording vague enough to exclude copper, gold, nickel, cobalt, and silver because of the potential economic possibilities. The process of deep-sea mining is taxing on many levels, from the large amount of energy spent on the endeavor, to the interruption of the natural habitats and disruption of the seabed, the loss of biodiversity, and the possible

contamination and mortality that occurs from transporting such large quantities of metals (Halfar & Fujita, 2002). Since the 1950s the demand for oil as a fuel source has exponentially increased, increasing with it the plastics, pharmaceuticals, pesticides and fertilizers, cars, airplanes, and so forth that pollute our natural systems and our bodies. Moreover, the increasing demand for oil has quickly burned through several millions of years worth of fossilized forests and microbes of ancient oceans, quickly diminishing the sources and requiring more deep ocean exploration, drilling, and pipelining (Earle & McKibben, 2010). This in turn leads to such negative ramifications as the interruption of sea floor and natural habitats, health risks, and marine organism mortality. These negative ramifications do not even include the very serious effects of oil spills, which are as small as the oil left under our cars, which travels through the groundwater back to the ocean to the very large spills resulting from such events as the *Exxon Valdez* tanker spill and the *Deepwater Horizon* pipeline explosion. The oil issue extends even further through the creation of exclusive drilling rights. Fishing access and water supply have also been privatized in response to fears over scarcity and degradation. Mangrove habitats stabilize bottom sediment and protect against storm surges. They are an important filter runoff from inland regions, a nursery, shelter, and source of food for many marine organisms, and more. Yet, mangrove habitats are under extreme pressure due to environmental toxins and their economic value, resulting in a loss of more than half of the world's mangrove population. Mangrove habitats are depleted for several reasons, but primarily for the space they occupy that can be used for aquaculture and residential and leisure development, a major source of revenue (Choudhury, 2000). Marine organisms are kept in aquariums, training centers, or swim with dolphin

programs, unable to live naturally in their ocean habitat. Our consumer culture is driven by the demand for the latest good or service, where such demand triggers greater resource extraction, production, packaging, and distribution. From there, the consumer uses energy to obtain the product, discards the packaging, uses the product, and eventually discards of that as well. Though much of this disposal occurs on land, the waste still makes it way to the ocean, resulting in nearly 80% of the plastic debris in the ocean worldwide. The ocean is seen as a *commodity*, something that can be traded for profit, possibly in part due to the myth sustained in its vastness—that it is just so large that it can never be irreparably damaged. We know this idea is not accurate. The world could run out of seafood by 2048 if we continue to deplete our fisheries at current rates (Eilperin, 2006). Overfishing, pollution, and other environmental influences are negatively affecting species populations worldwide. These factors make it difficult for species to reproduce and resist disease.

Marine policy has been most influenced by economic development, of which commercial fishing, marine tourism, and offshore oil exploration, are only a few examples from a long list. In recent decades there has been a push for increased environmental protection measures for the ocean, including marine biosphere reserves and endangered species legislation, though such measures are influenced by economic development through ecotourism and sustainable development. The anthropocentric viewpoint reigns in this conversation of economy, and policy choices are influenced by values. For example, policymakers push to devise fishing practices that ensure a healthy future population, but only because they will benefit the human community. Now consider how an erotic view positions that the ocean Other, including its inhabitants, have

moral worth. We are reminded by the court cases earlier this year where PETA argued for the release of orca whales from Sea World under the claim that the killer whales should have the same constitutional rights as people. Around the same time, philosophers, and conservation and animal behavior experts called for a Declaration of Rights for Cetaceans. In both cases, the experts claim that dolphins and whales are self-aware and sufficiently intelligent to justify the same rights as humans, as evidenced by their behavior and interaction (BBC News World, 2012). The cases never went through, and a Declaration of Rights for Cetaceans has yet to pass. Acknowledging that cetaceans have moral worth and deserve the same rights as humans would put an end to whaling, killing dolphins for meat, and the capturing and keeping of animals in captivity for human entertainment. Each of these factors is significantly influenced by the interwoven conversation of economics in policy.

To what extent and who is qualified to make decisions about the ocean? Having a hierarchy of groups of individuals is not pragmatic. However, considering one of the most serious policy issues facing our oceans today is free oceans, or the notion that a majority of our world's oceans are 'unowned' with only 200 miles of national policing on each coastal country's coastline, it is evident that some charge has to be taken to protect from acts such as illegal fishing. Pinchot (1947) argues that it is a necessity for a hierarchy through government ownership and/or regulation, not only to ensure regulation occurs, but just generally because we can't rely on the free market of our natural resources without leading to a "tragedy of the commons" mindset. But does this prevent the public, our students, from active participation? Our students are a small subset of concerned citizens, but their voice is mighty. As teachers strive to become erotic or to

increase an erotic ocean literacy with their students, their students will be more interested in and prepared for acting for *ecojustice* for ocean-related issues. Ecojustice is an ethical theory concerned with the relationship between social and environmental justice (Mueller, 2009). As such, it provides a guiding framework for helping individuals find a balance between protecting their cultural traditions and lessening their impacts on the environment. On the quest for transcendence, they have a responsibility to act for their project. This aim is embodied by erotic generosity for the ecojustice of the ocean-Other. Beauvoir's stance that children are practicing to be responsible adults holds, but where I differ is that their actions can make an impact now. Youth are not *becoming* citizens. They can prepare statements to give panel and group members who are preparing ocean-related management plans. This allows an opportunity for students' voices, and their values, to be represented. They can mindfully focus their actions locally and relevant to their everyday lives. Schools take advantage of water's usefulness in water fountains, sinks, cafeteria uses, and toilets. Students examine where their school's water supply comes from, determine where it goes and what human and nonhuman others are affected by it along the way. Learning to fish, garden, compost, recycle, bike, trade, barter, and share what we have with our neighbors all reduce the influences of our actions on the ocean by reducing our reliance on the market (c.f., Mueller, 2009). The popular notion of rushing out to obtain the latest cell phone, appliance, or computer does not always embody the consideration of whether e-waste will be recycled or end up in oceans and streams. Unfortunately, however, the issue extends beyond the destruction of the marine environment. The commodification of the ocean also encloses and marginalizes many communities, making ways of understanding the ocean, lifestyles, and rights vulnerable.



Consider, for example, the people of Ecuador who face enclosure because of mangrove depletion (Beitl, 2012). The mangroves of Ecuador have been removed for shrimp aquaculture to meet the ever-growing demand for cheap seafood. The mangrove ecosystem has provided for people of Ecuador in a variety of ways: Ecuadorians find sustenance in the fish, mollusks, and crustaceans that live in the mangrove habitat and use their wood for charcoal, construction, and fuel wood. Adults and children collect mangrove cockles from mangrove roots to sell at the market for family income. As students make meaning of ocean phenomena through a phenomenology of place, they are able to uncover the value of human and nonhuman Others. This revelation provides an opening for students to act generously for the ecojustice of these enclosures.

The ocean is one of our greatest commons, and yet we are headed for a tragedy of the commons. In the consideration of global fisheries, for example, it is claimed that the privatization of fishing was originated to prevent the collapse of fish stocks (Costello, Gaines, & Lynham, 2008). This links global overfishing to the property-rights of fisheries. Resource privatization, however, is a problematic solution for more than environmental issues, as it raises concern over the inequalities resulting from privatization of access rights. Major commercial fishing companies capitalize on wealth, while place-based livelihood is jeopardized and lost, especially for low-income and small-scale fishers and fisher people in small rural communities. Courtney Carothers (2010) describes another example of enclosure of the ocean commons:

Privatizing the right to fish in Alaska has had fundamental impacts on the fishing lifestyle in remote coastal communities. Enclosure and commodification of resource access rights has deeply constrained the flexible, opportunistic

engagements that have formed the backbone of rural economies for generations.

Dominant discourses of efficiency and profit maximization have marginalized

coastal community cultural logics structured around values of sufficiency. (p. 96).

Marginalization through commodification of ocean resources extends beyond a loss of livelihood to a decrease in the kind of flexibility that maintained a local economy or even just a family, and even to the erosion of community. Not surprising, those marginalized are often most in need of the ability to perform the duties of their livelihood. Why should students care if their families or communities are not directly marginalized by the enclosure of the ocean through the effects of commodification?

Globally, we have an unsustainable system, where the oceans' resources will continue to dwindle and degrade if humans worldwide continue on our current path of consumption. The ocean may provide an anecdote to the pollution of our lives if we respect and protect the eroticism inherent of the ocean. We seek to harness the powers of the ocean to fulfill our desires: overfishing just so we can have the freshest tuna, drilling through the seafloor to tailgate at football games in our SUV, and destroying wetlands for tourist sites and aquaculture. Those that benefit from this system are content so long as they are benefiting, but continually push for more, faster, and better. The beneficiaries feel as though the system fails them during times of natural disasters, war, depression—all things the beneficiaries categorize as not of our own making. How is this logical? As erotic embodied beings, we are responsible for our actions. We have failed the natural system through consumerism, overspending, waging wars, and polluting our air and waterways. We pride consumerism. Regardless of whether or not students are subject to marginalization, they are responsible for each thoughtless action they commit that may

have sacrificed the wellbeing of their bodies, their community, and the ocean. Students must take responsibility so that the ocean-Other can be free, thus propelling their own project into the future and making transcendence possible for self.

### **Summary**

Embracing an erotic ethic in consideration of the ocean, people realize the breadth of their responsibilities to the ocean-Other. As students engage in activities that promote a better understanding of the ocean, they are able to more clearly see how the ocean influences their lives and what effects their action has on the ocean. Further, through the development of an erotic relationship and authentic practices, students are better prepared to act more compassionately and ethically for the sake of the ocean Other. In this chapter I described my erotic ethic. My theory modifies Simone de Beauvoir's (1944, 1948, 2011) erotic ethic, and clarifies her assumptions of the erotic Other. This clarification is necessary to open the Other to greater possibility and pathways for transcendence. I developed three connecting arguments to demonstrate the importance of an erotic relationship with and for the ocean-Other, the epistemic eroticism and erotic generosity.

In my first argument, Argument A, I explained the position of ocean-as-Other, or ocean-Other. For centuries, humans have been trying to dominate the sea. This objectification and quest for ownership stemmed largely out of a desire for greater national economic success through trade, colonization, and fishing. Control over the coastal areas through ship ports and so forth in time extended to marine organisms. Fisheries are highly competitive, dolphins and whales are caught for meat and entertainment, and the introduction of invasive species are on the rise. Despite the best

attempts of humans to dominate the ocean, however, I rejected the objectification of the ocean-Other. I established a need to have an erotic ethic for the ocean-Other, which stems from my erotic experiences, the synaesthetic qualities of the marine environment, and the mutual reciprocity possible in an erotic relationship between humans and the ocean.

In Argument B I demonstrated the importance of equal opportunity for marine science education across the country. Inland students have equal opportunity as their coastal peers to degrade and protect the ocean environment. I discussed strategies for helping inland students develop an erotic relationship with the ocean. One strategy is linking the health of the ocean to the health of our bodies, which is an important connection for all students. I argued that the incorporation of marginalized ocean knowledge is an essential component of fostering an erotic relationship with the sea and working within a community for the protection of the ocean-Other. I connected intimate relationships with have with people to the erotic relationship we have or can develop and foster with the ocean. The relationship we have with the ocean comes from within us. It's in our bones and our essence. It provides a variety of health benefits, and increases our mental capabilities, one reason why the elderly should continue their project with the ocean. The elderly are our community's storytellers. They have a wealth of ocean knowledge that can only benefit the work we are doing to protect and conserve the ocean Other. They give vibrant voice to the ocean-Other. I also established a connection between mothering and our relationship with the ocean, how the ocean and mothers are similar, and as such, teach us important skills, knowledge, and ethical thinking to realize our possibilities and the possibilities of the ocean.

My third argument, Argument C, showed that in order for students to work for transcendence and freedom of the ocean Other, science educators need to help students establish a phenomenology of place. A phenomenology of place will allow students to reveal the most basic phenomena of the ocean. This revelation could ultimately challenge students to be conscious consumers of both ocean content knowledge and the goods and services they use. The ocean is the world's largest commons and in a world of consumerism, is being degraded, polluted, and sacrificed for more products, resources, energy, food, and much more. The vastness of the ocean does not correspond with its propensity to be irreparably damaged. We do not realize the importance of the sea to our lives, our livelihood, and our well-being, and we do not see the inherent value of the ocean. Finally, we do not live within our means. I show that the commodification of the ocean creates an enclosure of the ocean Others.

In chapter 5, I will provide a summary of my first four chapters and endeavor to make recommendations for the implementation and incorporation of an erotic ethic in science education. I will discuss educational implications for integrating marine science curriculum in science education, including the value of citizenship education and service learning to encourage erotic generosities. Further, I will address the importance of incorporating other projects and activities that promote a co-evolution with the ocean, with the goal of a more sustainable erotic relationship with the ocean. Finally, I will imagine an erotic science classroom, addressing any objections for an erotic ethic in science education and imagining what they future may hold for an erotic ethic in science education.

## **Chapter 5: Educational Implications**

In chapter four I developed an erotic ethic for science education based in the philosophy of Simone de Beauvoir (1944, 1948, 2011). My theory defended the position of ocean as Other, or ocean-Other. With this understanding, I argued that adopting an erotic ethic in consideration of the ocean is essential for conservation and freedom. Through the development of an erotic relationship with the ocean-Other, we recognize the possibilities of self and the ocean-Other that allow us to consider the ocean-Other as free and worthy of care. We become more open to grant erotic generosities for the ocean-Other's security in recognition of its moral worth. An erotic relationship with the ocean-Other is necessary for all people across the country, regardless of distance to the sea, age, or social class. This becomes evident when we consider how our actions are directly linked to the health of the ocean, which is in turn linked to the health of our bodies. With this knowledge, in part discovered through relationships with (O)thers, and preparedness to act, we can work against seeing the ocean as a commodity and act to sustain and protect its resources. Revealing the eroticism of the ocean and developing an erotic relationship with the ocean can promote the use of erotic generosities for the ocean-Other and provide a framework for the inclusion of an erotic ethic in environmental and science education.

My first goal for chapter five is to provide a summary of the previous four chapters. I highlight educational implications for the integration and implementation of an erotic ethic for marine science education within the larger domain of science education. Specifically, I use my theory to explain how developing citizenship in science

education can promote erotic generosity and establish the value of service learning in the community through erotic generosity. Next, I discuss projects and activities that can help science teachers and students co-evolve with the ocean-Other, including socioscientific issues-based (SSIs) instruction, student-scientist partnerships (SSPs), and inquiry. I address several possible objections for an erotic ethic in science education and conclude this chapter with recommendations for advancing an erotic science education.

### **An Erotic Ethic for Science Education**

I began this project by sharing details of my erotic relationship with the ocean, including a time when I began to see how intimately connected the ocean was to my life. I was diagnosed with scoliosis when I was ten, after a routine scoliosis check at school. I had been pulled out of my classroom with a few other girls, and we stood outside of a classroom being used as an examination room for about five minutes before the door opened. One of my classmates walked out, and I was sent in. The room was dimly lit. I recall warm browns and oranges. It smelled like dust. One of my classmate's mothers was a nurse and was sent to check the students at my middle school for scoliosis. She asked me to remove my uniform shirt and stand in front of her with my back to her. She quietly checked my hips and ran her fingers across my prominent right shoulder blade. She asked me to stand up straight, as if I was not already. She felt my hips again. The nurse took a few minutes to write something down and then asked me to bend over. She repeated the process, and then called into the hall for the school nurse. When the school nurse came in, the first nurse asked her to confirm what she saw. The nurses explained that my hips were slightly uneven, and my right shoulder blade stuck out more than the

left. They sent a note home to my parents to have me checked by my physician. At the time it was a minor curvature that needed no immediate action. After the onset of puberty, my doctor determined that my scoliosis had gotten worse. At this point it was necessary for me to wear a back brace to prevent it from progressing while I grew. I had an appointment every three to six months to check my scoliosis. After two years of wearing the brace twenty-three hours a day, my doctor explained that my growth plates indicated that I was done growing, and yet my scoliosis continued to progress. I have a less common form of idiopathic scoliosis that, without surgery, would continue to curve my spine, diminishing my lung capacity, putting pressure on my heart, and restricting my physical activity due to pain and limited range of motion. He said that at the rate of the progression, odds were good that by the time I was eighteen, my spine would be more than a 60° angle. I would never stand tall again. The day before my sixteenth birthday, I had a spinal fusion that straightened and stabilized my curving spine with coral. At the time, I understood little about the complexities of the surgery and how it would affect my life. I knew in some ways that my life would change as a result, but I did not understand then that through this inclusion of the ocean into my body, I was gaining freedom and possibility—transcendence.

In the grand scheme of my erotic relationship with the ocean, I had experiences previous to my surgery that laid occasional bricks in the foundation of my relationship. The coral took ten years to permanently solidify in my spine, supported by metal rods for temporary protection. This process paralleled the time it took for me to lay the cement in my own erotic relationship with the ocean, solidifying the foundation I had, at times subconsciously, been working on through the years. You see, although I had many erotic



and sensual experiences with the ocean in my youth, I lived in Ohio. In many ways, this limited my ability to cohesively understand how intertwined my life was with the ocean. My teachers did not incorporate marine or aquatic sciences into my classes, despite living an hour from Lake Erie, because they weren't required to and probably felt the many constraints of teaching what would be tested. With limited exposure and a lack of education, the various things in my life that were because of the ocean (e.g., seafood, various consumer goods transported via ship cargo, oil) or that impacted the ocean because of my actions (e.g., letting the tap run while I brushed my teeth, dumping sodas out near the creek by my house, losing my goggles in the ocean time after time) did not reveal to me the eroticism of the ocean. This revelation began as the coral grew in my body, with my curiosity about dolphin echolocation, and through all of the opportunities I was able to experience because of the stability and protection my modified spine afforded. Through the development of my erotic relationship with the sea, I became aware of my actions, the ocean's influence on my life, and my responsibility to act in erotic generosities for transcendence of self and ocean-Other. *My process of discovery is not the most ideal or typical, however.* The purpose of my research was to explore how the integration and emphasis of marine science curricula in science education can reveal and protect the eroticism of the ocean for all students. Through the inclusion of erotically-based marine science curricula in science education, students can foster their own erotic relationship with the ocean, become aware of how intimately they are linked to the ocean, and gain the tools and knowledge necessary to make decisions to act in a way that protects and preserves the ocean-Other through erotic generosities.

We now know that marine science education must be included in science education curriculum, legislation and school policy. Our oceans are extraordinarily influential to our environment and our lives. The oceans regulate weather and climate, provide the largest source of oxygen, are a source of protein and water, connect countries and cultures, provide jobs, and much more. But they are largely left out of the current science curriculum (NRC, 1996; AAAS, 1993, 2009), though the inclusion of marine science provides a prime opportunity for authentic inquiry practices and a cohesive understanding of natural systems. Through the integration of a marine science curriculum based on an erotic ethic, students can learn more than the intricacies of the marine science content and erotic marine serves as a conceptual model for all of science education. Students gain an understanding that the marine environment is valuable in its own right, not something to be objectified. Moreover, they can explore what measures to take to work for its protection, conservation, and to develop their own erotic ethic in science.

My introductory chapter described my intent to defend marine science education based on an erotic ethic through a philosophical methodology. I explained that I would use philosophy to analyze what should be ideal in science education and argue for these desirable education ends using logic and empirical evidence. More specifically, my philosophical style explores the phenomena of the ocean through personal experiences and phenomenological theorizing, based on the phenomenological method influenced by Husserl (1970), Heidegger (1962), Merleau-Ponty (1962), and Sarte (1956), among others. Through thick descriptions based on personal and theoretical experiences, I constructed arguments and defended major points that expose embedded ideologies and science curricula choices in an effort to inform educational policy and guide action that

ensures the protection of the ocean-Other, shared culture and cultural communities, and the integrity of community and the ocean environment. I closed chapter one explaining that my phenomenological analysis would be based on Simone de Beauvoir's erotic ethic (1944, 1948, 2011), which focuses on preserving the integrity of the Other through an erotic relationship of gifted reciprocity or erotic generosity.

Beauvoir was a prolific writer, which made narrowing my focus to her work that specifically addressed the erotic ethic. In chapter two, I presented my interpretation of her erotic ethic based on some of its major criteria: ambiguity, freedom, embodiment, responsibility, and generosity. Beauvoir's erotic ethic explains we are subject to situations beyond our control and the concrete details of life that both limit and determine our freedom. There are no definitive answers, but as erotic embodied beings, we have a responsibility to act for our projects. Rather than focus on negative characteristics, Beauvoir argues that through an erotic ethic, we should work joyfully for transcendence. Working joyfully for our projects challenges us to be more compassionate and ethical. The erotic ethic extends to the Other, as we cannot achieve transcendence without also striving for the freedom of the Other. If we fulfill our duty to act with generosity for the Other, our project propels relationships into the future. Erotic relationships are then based on mutual reciprocity, where both self and Other benefit. I discussed that although Beauvoir's erotic ethic is defensible, there are two major limitations that I would take up in chapter three and modify, including her stance on the freedom of women and nature.

Chapter three challenged Beauvoir's assumptions of nature and women in order to clarify the category of the 'erotic Other.' In doing so, I opened the erotic ethic so that it is befitting the kind of ethical teaching science education needs to incorporate to inspire and

education students to act for their projects. I began chapter three with a discussion on the theoretical category of nature-as-Other. Beauvoir (2011) argues that women fall subject to immanence, which blocks them from transcendence. Women are more closely related to nature because of what Beauvoir refers to as “enslavement to their biology,” where women are tethered to and valued based on their reproductive capabilities. Men, on the other hand, are more associated with culture, because they create the world around them with their minds and their hands through their choices and actions. Because men are not pinned to their biological abilities, they are able to work for their projects without the same distracters Beauvoir claims keep women from transcendence—menstrual cycles, pregnancy, childbirth, children, and menopause. I explained that in Beauvoir’s attempt to free women from the shackles of their bodies, she inadvertently positioned nature-as-other-than. This occurs as women attempt to mimic men by establishing a subject/object dualism, as Beauvoir posits men have done by establishing women as object or ‘second sex.’ I argued that in her perpetuation of an anthropocentric erotic ethic influenced by patriarchal root metaphors and rationalism, Beauvoir perpetuates the rift between nature and humans, allowing for domination and degradation of natural environments. Further, I established that if we challenge patriarchy and anthropocentrism, we can cultivate an erotic ethic that sees the preservation of and caring for nature-Other as a responsibility of our project. In this way, neither women nor nature are positioned as other-than – *second*.

The notion that women are valuable only based on their biological function is another reflection of patriarchal society. As Beauvoir asserts that women are slaves to their species based on their reproductive capabilities, my next argument in chapter three was that women do not need to transcend their biology to gain freedom. I explained that

through Beauvoir's erotic ethic, women should embrace their ambiguity, reject the negative qualifiers and repercussions, and embrace sexual freedom. For Beauvoir, sexual freedom grants women equal status to men sexually, where a woman should recognize and act on her sexual urges. I established that though women should embrace their sexual freedom, it is also the responsibility of women to take appropriate care of their freedom and transcendence in all regards through the consideration of viable birth control options, including abstinence, if it means that her energies are being directed for more worthwhile projects, or her freedom, or when the Other is being guarded. I further explained that though Beauvoir's argument for voluntary motherhood is pertinent to all women, not all women have equal access to safe and reliable birth control methods. In this case, abstinence may be the only option of birth control some women can utilize in an effort to exercise their right for voluntary motherhood.

Voluntary motherhood is an important cause for Beauvoir, who argues that motherhood limited a woman's freedom. My next argument regarding the transcendence of women is related to motherhood. I first established that my definition of *mother* does not necessarily relate to a woman getting pregnant and giving birth to a child. Though the biological connection often does apply, it is not a determining factor for motherhood. Mothers are people that have intimate, caring, and erotic relationships with children. Mothers challenge their children to assume their own ambiguity and live morally, ethically, and in recognition of their responsibilities to their project and Other(s). Mothers guide their children to make meaning in life and model erotic generosities. Moreover, I explained that mothers gain freedom by embracing their instinctual knowledge and primal ability to grant erotic generosities to their children. Further, mothers transcend in

the development of their relational experiences that allow them to act in reciprocity. I reject Beauvoir's limits on freedom for women based on *mothering* and *motherhood*.

I concluded chapter three with a discussion on menopausal women. Beauvoir asserts that because women are valued based on their reproductive capabilities, menopausal and post-menopausal women lose their essential function and, therefore, their potential for transcendence through their project. However, I rejected that freedom is limited through the process of menopause. Menopausal and post-menopausal women have the ability to make choices for their body to work for their health and well-being in ways that grant them freedom. Menopausal women seek freedom through, for example, medication that reverses bone loss and natural treatment options that prevent loss of sex drive, hormonal imbalance, and affected cognition and memory. Women in this phase of life also become mothers through adoption, surrogacy, or fertility treatment. I argued that menopausal women are further able to prevent a loss of freedom through positive self-perception and focus on their project. I discussed that aging women can maintain their project through thoughtful consideration and resourcefulness as they adapt to accommodate their ever aging bodies and changing situations.

The discussion in chapter three of the possibilities and responsibilities of the assumed 'Other' was intended to create a place for erotic ethic and generosities in science education. In chapter four, I more specifically focused on the use of an erotic ethic and erotic generosities for marine science education in science education. My key point is that an erotic ethic for marine science affords opportunities for students to gain an understanding of the ocean-Other and their responsibility to it and learn how to joyfully and ethically act for its care and conservation. The significance of an erotic relationship

with the ocean extends to people across the country, regardless of their proximity to the coast. The ocean is linked inextricably to the freshwater systems inland and the health of our bodies, also substantiating the value of marine science education. Through the implementation of marine science curricula in landlocked areas, students gain a perspective of their role in both the degradation and care of the ocean and how influential the ocean is in their lives, and for their bodies, much in the same way that I acknowledge.

Youth do not always have the opportunity to experience lived erotic relationships with the sea, but they still develop an erotic relationship with the ocean-Other through their own bodies. Therefore, in chapter four I established the link between human bodies and the ocean-Other as a valuable relationship for integrating marine science in science education. Our bodies are reliant on the ocean for the air and water we need for survival. More than that, the health of our bodies is dependent on a healthy ocean. From the ocean, we get food for nourishment and resources for medications. Exposure to the ocean has many psychological benefits as well, including stress and anxiety relief and attention restoration, which promote a feeling of well-being. Through an erotic relationship with the ocean-Other, where youth realize that the ocean-Other is worthy of freedom, they also recognize their own human bodies as valuable. This mutual reciprocity leads to erotic generosities between humans and ocean-Other, where each support the health and freedom of the other, which has significant implications for the classroom discussed later.

I explored and defended the importance of considering marginalized ocean knowledge in the development of an erotic relationship with the ocean-Other. The consideration of marginalized knowledge is also a key component of knowing how to protect it. I showed that we gain a greater understanding of the ocean through our

relationships with mothers and elders, as one example. Though the ocean has an innate relational essence, the relationships we experience with mothers and community elders help to reveal the eroticism of the ocean. I argued that mothers parallel the ocean in many ways while also demonstrating how to live ethically and erotically with the ocean in mind. Elders in our community offer invaluable, often marginalized, knowledge of the sea, which can be very beneficial in determining how best to care for it. Through a relationship with community elders, students learn to become storytellers for their communities and include rather than enclose their cultural knowledge. Through a consideration of marginal knowledge, teachers allow students to foster the development of their erotic relationship with the sea, while gaining a deeper understanding of the ocean and how to most effectively and thoughtfully work for its freedom and care.

Finally, in chapter four, I established a defense for the *phenomenology of place*. A phenomenology of place in science education allows youth to tap into their childish conceptions and get back to the phenomena. I explain that as students engage their senses and make meaning of the phenomena, they are able to determine what is valuable and worthy of protection and care. This idea is diametrically opposed to consumer-driven curricula and lifestyle, where the ocean-Other is not seen phenomenologically, as valuable or beneficial in its own right, but instead as a commodity for exploitation. Therefore, I concluded chapter four with a discussion on the importance of a phenomenology of place in science for the evaluation of ecojustice regarding the ocean-Other, by tackling issues of ocean commodification and enclosing of the ocean commons.



### **Developing Citizenship for Erotic Generosities**

*“Never doubt that a small group of thoughtful, committed, citizens can change the world.*

*Indeed, it is the only thing that ever has.”—Margaret Mead*

Scientific knowledge leads to provocation for action against social and environmental injustice (Aikenhead, 1985; Kolstø, 2001). It can bring the people of communities together to improve their local conditions. Scientific knowledge and thinking scientifically can essentially provide a framework for people to be better citizens. Following this logic, as youth gain an understanding of the marine environment, they are more likely to care for it and take action to protect it the eroticism of the ocean and the marine environment. This is evidenced by the numerous examples of children across the country caring for local aquatic environments through participation in beach and river clean-up days, organizing recycling programs in their schools, and children walking the beach in the early morning to rescue sea turtle hatchlings that have lost their way. Science teachers ought to strive to implement a model of erotic marine science education that provide students with the knowledge to provoke action for the betterment of their community and their local aquatic environments, which are linked inextricably to marine and freshwater environments worldwide. As I mentioned in the last chapter, students are not becoming citizens. They already are citizens, more fully capable of acting generously for their project. Through an erotic marine science education, students gain the knowledge necessary to act as citizen scientists. As citizen scientists, students then share in the responsibility of issues in the community and relating to the marine environment by participating more fully in democratic discourse.

In *Educating Citizens for Global Awareness* Gloria Ladson-Billings (2005) discusses the state of using schools and communities as sites of civic development. She explains that our current curriculum focuses on preparing students for active citizenship through ethnocentric and nationalist practices, where students are not fully able to make meaning of the civic education. She discusses part of the problem as viewed through Kathleen Cotton's 1996 review of literature, which identifies the following issues in civic education: lack of meaningful content, irrelevance, a lack of focus on citizen rights, a lack of training in thinking and process skills, focus on passive learning, avoidance of controversial topics, focus on teacher control and student obedience, low-quality curriculum for underrepresented students, a lack of attention to global issues, limited and shallow textbook content, text-bound instruction, and inappropriate assessment. Ladson-Billings (2005) further recognizes the disconnect between different student identities. When teachers focus on citizenship as an either/or situation, where students are discouraged from blending their cultural, political, and historical identities, they become alienated or bound to a specific identity that prevents them from more fully participating in citizenship responsibilities. She also explains that schools focus on compliance, rather than modeling active citizenship. Ladson-Billings refers to a report from *The Civic Mission of Schools* (2003), which describes competent and responsible citizens as informed and thoughtful, participants in their communities, political actors, and having moral and civic virtues. It is rare to find any of these qualities really fostered in schools, let alone all of them. She finally concludes that until our students see models of active citizens in their schools and classrooms, they are unable to make the connections needed to learn and engage in active citizenship.

Though Ladson-Billings specifically discusses civic education through a social studies context, these issues are just as relevant in science education today. If an erotically-based ocean literate person takes action through erotic generosity, they need to know how to act. Action through erotic generosity is a critical component of an erotic ethic, because it is in action that we can recognize and demonstrate that the strangeness of another as valuable and worthy of care. Through erotic generosity, we grant freedom and assume our own responsibility. How can science educators prepare science teachers to meet the needs of our students and demonstrate erotic generosity for them, particularly if students need to see physical, human examples of active citizenship? One possibility is through a humanist perspective ideology, which “promotes practical utility, human values, and a connectedness with societal events to achieve inclusiveness and a student orientation” (Aikenhead, 2006, p. 22). It is important, however, to amend this definition to include ecological consideration—an *ecohumanist* perspective, which allows for the valuation of the natural environment and its resources to human interests (Mikulak, 2007). According to Mikulak, an *ecohumanist* perspective considers Heidegger’s philosophical understanding that we cannot separate ourselves from our environment, and that in killing part of our environment, we are killing part of ourselves. This neglect is in stark contrast to the traditional ideology of science education, which often focuses on creating the next generation of scientists through mental training and scientific orientation. Zimmerman (1994) explains that the traditional ideology is an inauthentic existence that “seeks to protect and complete itself by dominating other people and by devouring the planet” (p. 111). Heidegger, on the other hand, posits that through an *ecohumanist* perspective, students “dwell authentically and in tune with [their]

surroundings in a way that allows things ‘to be,’ through a movement towards a more holistic, interdependent model of understanding [their] relationship with the environment” (Mikulak, p. 20). In other words, if science teachers help their students shift perspective to a more ecohumanist perspective, the students may strive to dwell authentically in their erotic relationship with the ocean and gain a more holistic understanding of the ocean-Other in order to act for its freedom.

In order to achieve this, science educators need to move beyond the goals of traditional western science education to include what is relevant to students, “usually determined by students’ cultural self-identities, students’ future contributions to society as citizens, and students’ interest in making personal utilitarian meaning out of various kinds of sciences—Western, citizen, or indigenous” (Aikenhead 2006, p. 23). Science educators can use this ecohumanist perspective to promote a science curricula that gets at the very basic understanding of phenomena. Through a connection to community, science educators can prepare science teachers to hone an erotic ethic in the classroom by demonstrating that situations provide opportunity and possibility, rather than limitations, as Beauvoir suggests. Water percolates from the surface to the groundwater, which is an essential process for sustainable groundwater management. It recharges the water table and replenishes aquifers. My project aligns with a ecohumanist perspective to say, foster an erotic ethic can develop citizenship if we imagine our students as water percolating through the water table of their community. As they establish and develop erotic relationships within the community, they allow their ‘water,’ or their passion, sensuality, generosity, and care for the Other, to flow through the community, recharging and revitalizing it. With a basic understanding of the phenomena in their place—their

community, local waterways, the ocean, natural environments—students are better able to think more clearly and meaningfully about issues affecting the phenomena, while drawing connections back to the community and their actions. Now, I will explore this idea while concomitantly looking at some of the emerging trends in science education.

### *Citizen Science*

To get at the ocean phenomena, science educators should gear pre-service teacher preparation such that science teachers are prepared to lead *citizen science* activities related to marine science issues within their own classes. Citizen science projects are those in which citizens collect and analyze data for research projects that are accommodating to citizens as scientists. Citizens work together with scientists to benefit the citizens and their communities, the research project, or both. Although two centuries ago scientists were almost all people working other professions, citizen science is now becoming increasingly popular with the increase in technology suitable for public use, the free labor citizens provide to scientists through their work, and many governmental funding agencies require public outreach projects (Silvertown, 2009). Research suggests that citizen science increases scientific knowledge (Brossard, Lewenstein, & Bronney, 2005; Bonney et al., 2009), provides a platform for engaging in scientific thought processes (Trumbull et al, 2000), and encourages participatory urbanism (Paulos, Honicky, Hooker, 2008), among other benefits. Moreover, Cooper et al. (2007) claim that citizen science can be used as a tool for conservation in residential neighborhoods. While students participate in citizen science projects, they are working intimately with the natural environment. Though the aforementioned benefits make integrating citizen

science projects in science education worthwhile, students also benefit from the marine phenomena they reveal through the phenomenological process of exploration.

Imagine if early in the school year or semester, science teachers and students collaboratively examined and decided on a marine-related issue affecting their local community for use as a citizen science project. They pick the decline of a fish population due to the introduction of invasive species, loss of spawning areas during drought, or the effects of changing water chemistry in local water systems that impact aquatic organism population and health of the water. Now consider high school students in an environmental science class in New York participating in a citizen science project as part of the Department of Environmental Conservation's (DEC) Hudson River Estuary Program (Marschhauser, 2012). Students take pictures and record data for the DEC's database in order to gain an understanding of how their part of the river relates to the larger Hudson River estuary ecosystem. Students wade out into the water, collect mud samples from the river bottom, sample water, and catch and identify fish before releasing them back into the river. As the students participate in this citizen science project they are improving scientific understanding, but perhaps more importantly, they are developing an appreciation of the Hudson River—they are wading into the water and unknowingly developing an erotic relationship. The participating environmental science teacher explains that students often interact with the river environment without really experiencing the river and looking at it deeply. Once the students begin to peel back the layers to expose the river phenomena, they can clearly see the river for what it is. This exposed river phenomena is necessary for students to establish erotic relationships with the river and make meaning of the relationships that encourages them to act for the river.

Students from across Georgia go to the University of Georgia Marine Institute on Sapelo Island to wade through the salt marsh for citizen science opportunities. Though the goal for much of these experiences is to expose students to scientific content and practices that might lead them into STEM (science, technology, engineering, and math) careers, acting as citizen scientists also helps them make more informed decisions in their personal lives. Moreover, it is hard to go out into the pristine estuary environment and participate in scientific research without being changed by it (Reinhardt, 2012). Citizen science opportunities provide an erotic experience that challenge students to reflect on the connections between self and environment. Following citizen science projects, science teachers have a valuable opportunity to guide students through moral and scientific discourse to encourage this reflection. Reflective processing is important for self-transformation that results in taking responsibility for social actions that leads to environmental degradation (Cranton, 2002). Without these erotic experiences, critical reflection for transformation is difficult. However, with little example of this in schools currently, science teacher programs need to focus on teaching skills that would develop citizenship, like citizen science and critical reflection. Science teacher education programs should also provide opportunities for science teachers to model these skills to assess and gain confidence in their abilities, particularly if modeling is an effective method of civic education. Through a focus on citizenship, science teachers can help students understand science content and gain an understanding of the work scientists do and the methods they employ. Perhaps more importantly, the students will also realize that they are capable of doing scientific inquiry and engaging in active citizenship, where

they can make the kind of decisions and take the kind of actions that can lead to positive change for the benefit of the marine environment and their local community.

### **Erotic Generosities through Service to the Community**

*One kernel is felt in a hogshead; one drop of water helps to swell the ocean; a spark of fire helps to give light to the world. None are too small, too feeble, too poor to be of service. Think of this and act. –Hannah Moore*

We need science teacher preparation programs that will prepare science teachers to use service-learning strategies comprised of erotic ethics. Specifically, the services provided in this type of service learning should be erotic generosities bestowed upon the Other for its freedom and because of its moral worth. More traditional service learning activities are typically classroom work in conjunction with authentic social action, or service, that students engage in for meaningful application of knowledge, practical skills, and the development of social responsibility and civic values (Barton, 2000). They generally involve planning, action, and reflection (Phillipson-Mower & Adams, 2010). The National and Community Service Act of 1990 established “service learning” to include:

- learning through active participation in service that meets the needs of a community
- a collaborative connection between the school and community
- the promotion of civic responsibility and sense of caring for others
- the enhancement of academic curriculum of the students
- structured time for participants to reflect on the experience



- opportunities to use newly acquired skills and knowledge in real-life situations

Recognizing that service learning is widely discussed in science education, I am rightly exploring one example. In informal science education situations, service learning has helped pre-service and in-service science teachers make personal and professional connections between science content and real-life scenarios (Crane et al., 1994). In science education programs, service learning provides opportunities for pre-service teachers to develop a multicultural science teaching practice, which allows them to make meaningful connections with community members and authenticates the kind of science being done (Barton, 2000). Students engaging in service learning also benefit, including increased academic achievement, improved personal and social skills, a developed citizenship, and improvement in school-community relationships (Kielsmeier et al., 2004). Moreover, as science students participate in community-based service learning activities, they learn science authentically, which prepares them for lifelong learning and active participation in society (Handa et al., 2008).

Though the integration of service learning activities is nothing new to science teacher education and science education, what I propose is a different project of service learning based on erotic generosities. This kind of service learning would include the components previously described, but it also capitalizes on the erotic relationships students will have unknowingly developed with their community and the ocean-Other. This focus is significant because students learn how to grant erotic generosities to the Other through their erotic relationship when explicitly explored. Service learning based on an erotic ethic allows students to get back to the basic essence of the link between people, their community, and the ocean-Other, but this work needs to be done on the

front end. Science teacher preparation programs need to teach science teachers how to help students bracket out the inessential details of their intimate relationships with Others to reveal the pure state. Ultimately, this allows students to live more authentically and generously to Other(s). One way science teachers can help students get to a phenomena is by directing them to connect with members of the community, like community elders, to glean from their intergenerational, scientific, and cultural knowledge. These interactions help students to begin stripping away inessential and irrelevant layers to get at the basic connection they have to this knowledge. Imagine, for example, if Rebecca, a seventh grade student living in urban Savannah, visits her grandmother once every few weeks. Perhaps Rebecca's grandmother pours for her an ice-cold glass of lemonade, and they sit together in rocking chairs on the front patio of her apartment building. During these visits, Rebecca's grandmother tells her stories about growing up near the Savannah River. Her grandmother's brothers spent long days fishing for trout, her mother took her down to the river's edge to watch the water flow and cargo ships weave through the channels, and she picked flowers along the river to weave into her hair. Rebecca learns about the days it rained so hard that the river flooded the city. Her grandmother also tells her stories of her experiences at the beaches of Savannah, where she played unrestrained in the breaking waves. Her grandmother tells Rebecca about the Tybee Bomb and the build up of tourism and recreational activity over the years. The primitive understanding community members convey can highlight how best to serve or act generously for the marine environment, because it helps students to uncover only those details that are pertinent. Through this phenomenological understanding, teachers can then help students

feel better prepared to serve the ocean in a way that protects and sustains the basic integrity of the natural environment.

Once students begin to grapple with ocean phenomena, what might they learn about the phenomena by going to the sea or another aquatic environment, where they can take off their shoes and let their feet explore the hot sand? What might they learn about science and the natural world through service learning activities, as the sea breeze whips their hair around their faces, seaweed washes ashore, and signs prevent them from trampling the dunes? Consider the approximately 2,000 undergraduate students that are engaging in service learning programs in Ohio, Michigan, Indiana, Illinois, Minnesota, and Wisconsin for the restoration of the Great Lakes ecosystem (Odenbrett, 2012). The students focus specifically on preventing pollution through chemical runoff, combating invasive species, promoting near-shore health through watershed protection, and restoration of endangered wetlands and other habitats. There are other examples, such as the sixth grade science class in west Michigan that installs native plant buffers on the private shorelines of two lakes that eventually flow into Lake Michigan (GLSI, 2010). The students want to make connections between the science content they were learning in class (e.g., point and nonpoint source pollution, invasive and native species) and their community. They are particularly concerned about fertilizer runoff and grass clippings entering the water, making its way into the Great Lakes system. Through these service learning projects, students learn important science content, but they are also more likely to act as lifelong stewards out of eroticism (GLSI, 2010). Community involvement might also be more sustainable, as the community has a moral responsibility to act generously in order to achieve transcendence for self and ocean Other. Service learning is one major

example of erotically-based marine science project that can be utilized in the science classroom to promote erotic generosities and erotic relationships. I will now explore the potential of other projects focused on authentic inquiry.

### **Projects and Activities to Stimulate Co-Evolution**

*There is too much of make-believe, self-deception and submission to convention. The field of education which holds the seeds of the future of the children of the soil requires absolute sincerity, fearlessness in the pursuit of truth and boldest experiments, provided always that they are sound and based upon deep thought matured and sanctified by a life of consecration. Not every tyro in education may make such experiments. If the field is vast enough for sound experimenting, it is too dangerous for hasty and ill-conceived prospecting such as people in feverish search of gold delight in. –Mahatma Gandhi, 1953*

Some scientists and marine resource managers are concerned for the ecology of the ocean because of its own inherent value, rather than for the remediation or conservation measures of marine ecology for human utility, such as the marine species we depend on for food. Hale and Dilling (2010) argue that we exercise the precautionary principle and stop using marine resources arbitrarily, because we are not able to control the results of human activities on the ocean. Through these considerations, marine resources would be distributed broadly and equitably among present and future generations. Moreover, this type of care might lead to an erotically-based, sustainable environmental management, rather than a focus on already dwindling resources. Perhaps what Hale and Dilling are defending is a co-evolution with our natural environments, where we recognize the

transformations occurring in these environments through our erotic relationship and experiences with them. We in turn adapt to meet the needs and changes of the natural environment and learn to live sustainably within our limits. If we co-evolve with our natural environments, we are not only more capable of adapting by way of erotic thinking, we also focus on and strive for an erotic relationship with our environment that is based on reciprocity, where it is mutually sustaining and conserving. We need science education programs that prepare science teachers to engage students in projects and activities that stimulate this co-evolution through the development of meaningful erotics.

To determine how science education programs bolster this sort of curriculum, we might consider the work of Rachel Carson, who had a fierce erotic relationship with the sea and spent her life granting erotic generosities for the ocean because of this relationship. What about her erotic ethic is meaningful for science education? Carson sparked the interest of public and government officials alike; her passionate writing became the ignition for interest and action in environmental conservation efforts around the world. She called for critical thinking on scientific issues, action for scientific learning and growth toward ecojustice. She established the significance for children to always have a sense of wonder about the natural world. Carson was deeply embedded and actively engaged in the inquiry for her research, because of the love she had for the sea. These qualities are all necessary to move the field of science education and marine science education forward, just as she was able to do with her environmental conservation efforts. It's time for our science educators to focus on fostering the kind of curriculum in science education that aligns with Carson's lived experiences, where authentic inquiry is key to developing or maintaining a sense of wonder about the natural

world. Moreover, authentic inquiry activities like socioscientific issue (SSI) cases and student scientist partnerships (SSP) promote a co-evolution with the marine environment to build and strengthen our erotic relationships.



Figure 7. Co-evolution with the ocean-Other through authentic inquiry

### *Socioscientific Issue or Case Based Instruction*

Since the middle of the nineteenth century it has been apparent that marine science education should be included in K-12 education as an authentic means to inquiry and scientific literacy (Benson, 1988). Marine science education began through naturalist knowledge, with an emphasis on experiential learning and gaining an understanding of nature *through* nature. Policy, higher education, and informal education sources have all been active players towards the implementation of marine science curricula, and yet it still sits on the back burner. Marine science education is valuable, however, especially when taught as an integrated course (Lambert, 2006), because it incorporates a large variety of content areas and aids students in gaining a more holistic and coherent view of the world. Marine science education is very amenable to the use of current local, national,

or international events as thematic lessons or examples of applied content, which helps students to see relevance to their lives and communities. Through active participation in these thematic lessons and marine science experiences, students attach emotion and values to the content, linking it to economic, environmental, and social issues. Marine science education, then, is a prime opportunity to utilize *socioscientific issue* (SSI) cases, which is the use of usually controversial scientific topics that require “a degree of moral reasoning or the evaluation of ethical concerns in the process of arriving at decisions regarding possible resolution of those issues” (Zeidler & Nicols, 2009, p. 49). Using SSIs for marine science study engages higher-levels of thinking and promotes decision-making based on this better understanding of the ocean phenomena. For example, Marrero and Mensah (2010, p. 5) engaged middle school students involved in the NOAA-sponsored ocean-literacy program, Signals of Spring (ACES), in SSIs to answer the question: “In what ways do students engaged in an ocean literacy-focused curriculum draw upon scientific concepts of the ocean when considering personal and societal decisions related to it?” The students involved in the study went through a year-long program, where upon completion, the authors had four major findings. First, students understood that their personal choices impacted ocean organisms. Second, students saw a link between land activities as they related to food production and the impact on the ocean. Third, students observed a connection between different types of pollution and the impact it had on marine organisms. Finally, students used higher-levels of thinking and inquiry, emotion, and values when considering marine-related issues. Further, SSI-based case instruction challenges students to analyze the issue using an ecojustice lens (Mueller & Zeidler, 2010), which can be paired with an erotic ethic to teach students the importance of

ecological sustainability and helping all affected organisms, including humans, through erotic generosity—essentially, erotic projects of justice and fairness for the environment.

Marine habitat degradation, namely, provides opportunities for young people to evaluate environmental fairness and social inequities. Students can explore socioscientific issues relating to the islands of garbage in the ocean, how it got there, and whom it affects. They can investigate issues centered on the rights of marine mammals, where organizations are advocating for freedom, justice, and rights for whales and dolphins because of their degree of intelligence and self-awareness. Students examine internationally relevant issues relating to access to clean drinking water, how the ocean is involved, and the types of implications this may have. They examine the issue from the perspective of organisms who live in affected areas, impoverished communities, students, major corporations, scientists, surfers, river keepers, and so forth to develop a position based on their investigation. Using socioscientific issue-based cases is a great way to integrate ocean sciences into curricula, where youth can share responsibility for important global community and environmental choices. This integration makes it a worthwhile endeavor for fostering generosity to the ocean and a responsible citizenry that seeks conservation and protection of the ocean. Though it may not be easy, science teachers need to be prepared to use socioscientific issues in their classes to take advantage of this opportunity.

### *Student-Scientist Partnerships or Apprenticeships*

Within science education, most science learning occurs within the classroom. Despite teachers' best efforts to incorporate laboratory activities and inquiry-based activities,



there are few ways better than teaching students how to be scientists than by actually doing the work of scientists. *Student-scientist partnerships* (SSPs) involve students working in science laboratories or the field as apprentices to a scientist. Through this method, students learn and engage in authentic scientific practices, using authentic equipment in an authentic research laboratory. When students partner with research scientists, they are able to break through the limitations of a traditional science classroom, including structured learning activities that are carefully orchestrated and pre-determined by the teacher.

Sadler, Burgin, McKinney, and Ponjuan (2010) suggest that there are many benefits to student-scientist partnerships. Working with scientists often increases or affirms a student's interest in a science career. Apprenticeship programs offer new perspectives on how science is done, and students who engage in these authentic science practices have increased nature of science understandings because they are able to perform inquiry without a true known endpoint. Students gain a respect for the tediousness and messiness of science and the hard work that scientists have to do. Through student-scientist partnership experiences, students increase their content knowledge, perception of understanding, confidence, and self-efficacy. Students learn the kind of discourse appropriate for the scientific community, and they learned the importance of collaboration in science. Imagine the meaningful relationships students can develop with scientists and the impact they can have together for the sake of the ocean. If students engage in student-scientist partnerships in ocean science laboratories, they will have increased understandings of nature of science and ocean literacy. They also develop a more sophisticated and confident identity of themselves as scientist. Through a growing

appreciation of what scientists do and an enhancement of their discourse skills, students become better navigators of their ocean science knowledge and more prepared to act for the conservation and protection of the ocean Other.

Baumgartner, Duncan, and Handler (2006) study marine-related SSPs, where students work with scientists to collect data on sand-diving fish, hammerhead shark pups, and the behavior of small, cryptic fish. The students go fishing for these organisms, capture them, and investigate their bodies and behaviors. They either release them or create habitats for them, further exploring the fish they are studying. The researchers find that through SSPs, students' scientific literacy increases if they are embedded in the research. Moreover, they claim that students become excited and engaged when authentically investigating science through SSPs, which in turn enhances the content and skill knowledge of the students. Obviously, these kinds of scientific investigations offer much more to students. As an undergraduate I participated in two research cruises of varying lengths, where I collected water and sediment samples for carbon and nitrogen analysis. As a graduate student, I spent days and weeks as the coast of Georgia collecting water and sediment samples for nutrient analysis and biological assays. The scenarios I am describing here are slightly different than the SSPs aforementioned but nonetheless make the point about the kind of science education I advocate. I was no longer a K-12 student, and these were my research projects. However, I was still a student working with scientists to benefit their project and my own education, which is aligned with the general notion of SSPs. Though the initial purpose of my participation in these research cruises was to collect and process samples and analyze the data as a scientist, I learned a great deal through my experiences in these scientific activities. Indeed, I may have learned

more about science and the ocean phenomena standing on the deck of a research vessel at two o'clock in the morning, when the water and the sky melted into each other and were unrecognizable as two separate entities, or when I was waist deep in the salt marsh, feeling the water flow around me, watching the snails climb up the *spartina*, and smelling the sulfuric marsh mud. The synaesthesia of these environments opened my mind and made my heart swell, and I longed to act with generosities for the protection of the ocean. Inquiry experiences such as this can then provide students with understanding of their place in the world, the recognition of their responsibility for their actions, and a charge to act with erotic generosities to remediate or protect that which they are exploring.



Figure 8. Research cruise, Gulf of Mexico, 2004

The benefits of SSPs in science education are evident, and yet they are not typically utilized in science classrooms. Science educators ought to help science teachers develop the skills necessary to establish and implement SSPs in their classroom. Science teachers need to understand how to create clear goals for their partnership, so that both students and researchers benefit. Teacher preparation programs could also model these sorts of relationships, particularly because it may be difficult for science teachers to

initially establish a relationship with a marine scientists that would be willing to work with students. In this way, science educators encourage future science teachers to make these connections and begin brainstorming research ideas. The development of SSPs in teacher education is valuable, as the implementation of more authentic inquiry activities ultimately provides a platform for science teachers to introduce an erotic ethic and the significance of erotic generosities. These changes are essential to moving marine science education forward, but they are not exclusive to creating an erotic science classroom.

### **The Erotic Science Classroom**

*Understanding that eros is a force that enhances our overall effort to be self-actualizing, that it can provide an epistemological grounding informing how we know what we know, enables both professors and students to use such energy in a classroom setting in ways that invigorate discussion and excite the critical imagination.* (hooks, 1994, p. 195).

While I was finishing my master's degree, I taught chemistry at a public high school in Lilburn, Georgia. The first year I taught there, I woke up at four o'clock in the morning each school day in order to make it to school before my students arrived. Inevitably, there always seemed to be a line of students outside of my door. Sometimes they needed help with their homework, a quiet place to nap before their first class, and many times, they needed someone to talk to. Thinking back on those times, I feel good that I had created a safe environment for my students, and that I was approachable enough for them to share some of their deepest, most troubling secrets. Many afternoons I spent in the guidance counselor's office talking about a student who confided in me that morning. I was there

for the student who came to me when she discovered she was pregnant, who was being bullied by other students, who was being abused by a parent, whose family didn't have enough food to feed them, or whose mother kicked him out of his home in order to placate her new boyfriend. My heart broke for those kids. Other teachers thought I was too free with my time. They told me to go home, put a sign on my door saying that I was busy, or direct them to someone else. It's true; there were days when I was at work so long that I saw my husband only long enough to quickly eat the dinner he made for me before I fell into my bed to sleep. That job took a lot out of me physically, mentally, and emotionally. Although the job requirements of a teacher are certainly demanding, I can say now that much of my exhaustion was self-induced by not trusting my own eroticism to help my students learn science.

When I was setting up my classroom before that school year began, I was so hopeful, as I think many first-year teachers are. I had big plans for inspiring my students, helping them develop into active citizens, and teaching chemistry so well, it would blow them away. Within a few weeks, I began to feel discouraged. The five other chemistry teachers in our department would scoff at my ideas for citizen science projects and thematic units for chemistry that involved community participation and authentic inquiry. "That's not what we're doing!" they'd say. "Why are you making this so hard on yourself? We all use the same lessons!" In their minds, their way was best, but I did not understand why. I was swimming against a current. Their experiences told them that my intentions were laughable. A few weeks later, I was just days before giving my students their first Benchmark test in my class. I can remember sitting at my desk with a stack of practice Benchmark tests in front of me, thinking maybe the other chemistry teachers

were right. You see, many science teachers fail to incorporate more progressive, authentic ways of teaching science because of the time and energy required, how slow content is covered in this way, and the pressure they feel to get through the content quickly to ensure that students are “prepared” for the end-of-course, high-stakes, standardized tests. This usually means that science teachers use traditional lecture and shallow learning activities to teach memorization of facts, not deep cognitive understanding (Costenson & Lawson, 1986; Smith, Hounshell, Copolo, & Wilkerson, 1992; Jones et al., 1999). Teaching is a slippery slope. Despite ourselves, we often fall victim to the game. We feel like we have to “teach to the test,” to ensure that our schools get good reports and to guarantee our jobs for another year. I am admitting now that I gave in. It was not a full and willing surrender.

I tried to stay on par with the chemistry teachers in my department, and I often had my students perform the same laboratory exercises that their students did, even when I did not think they were challenging or authentic enough. I modified some of the tests or lecture notes that the other teachers used, and I drilled my students a few days before each Benchmark test, as they had. I also went to my colleagues for help when I was felt like I was drowning. I allowed myself these things, I thought, because I was part of a community. Where I failed was not being a better model to them. I gave up too easily when they said I was naïve to think I would have the time to teach my students in the way I thought was best. In reality then, I was actually not an active member of my community. Despite my resignation on some things, I did stick to my guns about others. I used socioscientific issue-based lessons before I even knew what they were. I tried to bring relevancy to chemistry and provide interesting interdisciplinary lessons. I wanted

my students to see chemistry for more than elements on a periodic table or thermodynamics laws, but rather as something that was hugely influential in their lives. I also tried to include activities or lessons that developed a sense of responsibility and citizenship (Mueller & Luther, in press). For example, on the first day of school, although not directly related to chemistry, I set recycling bins right next to the garbage can in my classroom—one for paper, one for plastic. Other teachers laughed, saying it was a waste of my time. My students would never use the bins, they said. I recycle at home though, and it seemed like such a waste of an opportunity and valuable resources to not do the same in my classroom. I was shocked though in the first few weeks when the other teachers were right. Despite the recycling bins being right next to the garbage can, a majority of my students chose not to place all recyclable materials in the garbage can. Many used the recycling bins for regular garbage, my least favorite being their gum. One day I asked them about it, and it was evident by their answers that many of the students did not know why they should even care about recycling. I felt a sense of urgency to integrate these kinds of lessons into my curriculum. By the end of the school year, I was carrying out more recycling per week than could fit in my car. Some of the physics teachers commented the next year that they always knew which of their new students had me for their chemistry teacher. They performed well and were in general thinking more critically than their peers. This was elating news, but more importantly, it made me realize that my little bit of effort made a big difference in their science understanding and motivation to act for issues that were important to them. My point here is that there is possibility beyond the *Status Quo*. Though I did not understand it at the time, I was developing an erotic ethic within the walls of my classroom. I was fostering erotic

relationships with many of my students, and these relationships were based on mutual reciprocity. I learned as much from them as I taught to them. They allowed me an opportunity of transcendence, as I was offering it to them. This is often not the case for many reasons, some of which I will address now.

*Objections for an Erotically-based Science Education Curriculum*

*“One can reveal the world only on the basis revealed by other men.”—Simone de Beauvoir (1948, p. 71)*

Some of the things I have discussed here are not exactly cost effective on a teacher salary and a school or departmental budget. The use of research vessels, sampling equipment, authentic laboratory equipment, transportation for field trips into the community, and so forth can all add up to often many times more than a teacher can afford. Despite this, teachers should not be discouraged. There are ways to access funds to integrate costly lessons that develop an erotic relationship with the ocean and establish a phenomenology of place. For example, The Chesapeake Bay Trust is funding the Chesapeake Bay Watershed Study. Just recently NOAA announced their decision to fund \$4.5 million in grants from their Office of Education’s Environmental Literacy Grants Program to enhance science education activities in the classroom, aquariums, museums and other institutions across America. Interestingly, NOAA’s goal for these projects is the increase stewardship and informed decision-making for marine and aquatic areas, rather than a focus on future scientists. Earlier this year, the Navy increased their support for STEM education by almost double. Though the Navy’s goal in this action was an investment in their future workforce, there are ways to easily integrate an erotic ethic while teaching



authentic scientific practices, aforementioned. Though many grants are competitive, the possibility for funding through agencies such as these abound. Local companies are often willing to donate funds, services, or equipment for education. Students could fundraise in their communities or accept donations for these unique opportunities.

Beyond the logistical challenges to the consideration of an erotic ethic in science education, there exists another potential source of objection. In *The Bonds of Freedom: Simone de Beauvoir's Existential Ethics*, Kristana Arp (2001) questions whether Beauvoir's ethic of ambiguity is a form of ethical subjectivism. Ethical subjectivism is a view that ethical thought is based on human perception exclusively. Consequently, judgments and actions based on these ethical beliefs are also based on and limited by the perception and attitudes of people. Ethical decisions then are rooted in feelings, preferences, and limited understandings of the people making them, rather than formed using logic. Although Arp finds value in Beauvoir's major ethical points, she worries that her theory can be weakened if it is based on ethical subjectivism. Because Beauvoir's ethic of ambiguity is such a large part of her erotic ethic, it is possible that her erotic ethic can fall under this scrutiny. If this were the case, there would be little benefit to foster an erotic ethic in science education, because it would be based on the whims and emotions of the science teacher, rather than the moral value logically defended in phenomenology.

I argue that Beauvoir's erotic ethic is not a form of ethical subjectivism for two major reasons: Beauvoir's erotic relationships are supported by mutual reciprocity, and Beauvoir's erotic ethic offers ground of the appropriateness of moral action, which is shared ethic. As I discussed in chapter two, Beauvoir argues that freedom is relational. Man cannot embrace his own freedom without working for the freedom of the Other such

that his project is valued. Indeed, our freedom is reliant on the freedom of Others. Further, in granting freedom to the Other, we are ensuring that our project extends into the future. Our projects and freedom are inextricably linked. Beauvoir's erotic ethic, then, is intersubjective, where one's ethical beliefs rely on the beliefs of another or unborn. Through this understanding, ethical views cannot be created in isolation. Thus, they cannot hold logically without intellectual consideration of more than one person. Inasmuch as phenomenological work is highly individual, it is a shared ethic of eroticism.

As I also mentioned in chapter two, Beauvoir acknowledges that we are subject to the uncontrollable conditions of human existence. Beauvoir argues that we work harder and joyfully to be more ethical and compassionate human beings. However, because of the situations out of our control, her erotic ethic cannot definitively offer what is right or wrong, or who is to blame in certain situations. Beauvoir does, however, explain that part of being ambiguous is not knowing how our past or current actions will affect our future possibilities. Though we have no specific gauge for moral freedom and integrity, if our freedom is reliant on the freedom of the Other, we will always act in a way that offers the possibility of moral freedom. In other words, we always have an impression of whether our action will lead to moral freedom, particularly in considering whether we are treating the Other as a subject or an object. In *The Ethics of Ambiguity* (1948) Beauvoir notes that though it is our responsibility to always act morally for the sake of the Other's freedom, it is in our intention that we gain freedom as well. Despite our best intentions, we cannot act for the Other, only with the Other. It is relationality that makes erotic ethic different. Therefore, the outcome may not always be the most desirable. Ultimately, we can know that we are acting more compassionately and morally if we treat the Other as a subject,

worthy of freedom and care, valuable in its own right, and a moral agent. In consideration of these two points, it does not seem logical for Beauvoir's erotic ethic to fail to ethical subjectivism, therefore I maintain an erotic ethic's credence for science education.

As a second point, the erotic ethic for the ocean-Other may be critiqued for the charge of anthropomorphizing the ocean, or attaching human characteristics to the nonhuman ocean. I explain that the ocean-Other is in some ways comparable to people in our lives, like our mothers, and that it is capable of protecting us and striving for our freedom as we do for it. It could be argued that anthropomorphism is detrimental to the erotic ethic, as it makes it easy to confuse emotion with logic, providing an opening for feminizing or further objectifying the ocean, which is in some ways misleading about the actual ocean phenomena, and increasing a possibility of commodification (Cater, 2010). However, in my quasi-personification of the ocean-Other as human-like, my intention is simple: to provide a metaphor that is relatable to humans (Watts & Bentley, 2007) so that we better understand the parameters of violence and erotic generosity to the ocean. Anthropomorphism is an important tool for positioning humans in nature, where it has the potential to offset anthropocentrism (Perrault, 2009). Moreover, anthropomorphism allows me to phenomenologically describe ocean phenomena in a way that is consistent with the methodological approach (for science educators who do not understand theory), drawing sensuous attention to a phenomena and its value. Though anthropomorphisizing the ocean can certainly have disadvantages, especially in terms of positioning the ocean as Other, in the case of this research, it should actually work to liberate the ocean-Other.

*Recommendations for Future Erotic Ethic Research*

*I have always seen the oceans as a school for democracy on a global—but also regional and even national—scale; a school for cooperation, understanding and common security.*

(Mario Soares, 1998, p. 10)

The main goal of science educators is to promote scientific understanding for their students, where students can use this knowledge beyond their formal education. There has been a recent push by policy makers and educators for this scientific knowledge to be honed for jobs in STEM (Science, Technology, Engineering, and Math) with the purpose of adding jobs and staying competitive in the global market (Price, 2012). Inquiry in science education for the purpose of increasing scientific knowledge has been around for quite awhile, and science educators are focusing on STEM education in teacher preparation programs. Science teachers are trying to accommodate by incorporating math in their lessons and encouraging literacy, critical thinking skills, and nature of science. Many teachers engage their students in inquiry experiences outside to draw real world connections with the natural world. However, I suspect that students who spend time actively engaged with the natural environment through authentic inquiry—developing an erotic relationship with the sea—will be more likely to enter STEM jobs without it being a main goal of the curriculum and folks in non-STEM fields will likewise feel included.

When I first came to the University of Georgia, I had actually been admitted to the doctoral program in the Marine Sciences department. As an undergraduate, I had an erotic connection to the ocean through my marine science research. Reflecting back, that connection was a culmination of many factors: my previous erotic experiences with the

sea, my advisor at USC took the time to develop an erotic relationship with me, and he also stressed the importance of the sea and staying connected to it. Over the years through my various interactions with marine scientists, I realize that my undergraduate advisor is not a typical example of a research scientist. Although I am generalizing here, I understand that there are many brilliant and talented marine scientists that take the time to develop and promote erotic relationships in their research groups. However, it not typical to what I have seen and experienced. When I began my doctoral degree in marine sciences, I had an advisor that was very different from my advisor at USC. In fact, when I asked my undergraduate advisor for advice on choosing graduate schools, he referred to the woman I ultimately chose for a doctoral advisor in Georgia as a “pistol.” To this day I do not know why I did not heed that warning. My previous doctoral advisor is one in a long line of classically-trained, patriarchally-influenced research scientists. She teaches her students in the same way she was taught. In her research lab, she feels justified to dominate and oppress. She expects her students to work a minimum of sixteen hours a day in the lab and to continue working on writing and research at home. She suggests sleeping in the lab on cots, and is very dedicated to multitasking projects to get the most out of her students’ time. When her students show fatigue, she pushes harder. She employs one of many oppressive strategies to maintain her control. One evening in the lab, as I was pushing rubber stoppers into a glass tube as part of my experimental setup, I pushed too hard with too little lubrication. The glass tube shattered, and the broken glass went through my glove into my hand. I was bleeding everywhere. One of my lab mates drove me to the health center, and the urgent care doctor said that my hand was “peeled like a banana.” She stitched me up, wrapped my hand in enough gauze that I could not

bend my fingers, and I went home. I called my advisor on the way home to explain what had happened, and she was quite angry that I left before completely setting up my experiment. She said I could still work with one hand and expected me there to fix it in the morning. It was not easy to push rubber stoppers into one hundred test tubes using only one hand the next day. It was examples like this that drove a wedge in my relationship with the ocean. I spent long hours in a lab lit with artificial light. I worked with water samples that I had collected, but I was so disconnected from them that their origin had no meaning. I was resentful of her and the image of scientist she was perpetuating. The erotic relationship I once had with the ocean was starting to fade. When I reflected on whether I should leave the field all together, because of my dwindling erotic connection to the ocean and my anger at my advisor, the answer became clear that I needed to work to change this perception of scientists to mirror that of my undergraduate advisor. It is possible to develop scientific understandings while fostering a sustainable erotic relationship with the sea, and it does not have to occur at the expense of the freedom of self or Other. In consideration of this conclusion, it might be beneficial to explore the possibilities of a STEM curriculum that is based on an erotic ethic. In this case, students may ultimately be encouraged to seek employment in STEM fields. However, the eroticism that leads the students to this pathway is sustained through the relationships that are developed through the authentic and erotic science experiences.



Figure 9. Developing an erotic relationship with the sea through field work

Another possible avenue of further research is to consider ways in which science teachers shift the science content they teach to emphasize more specifically, through examples and action, that our efforts have a higher purpose. It is no longer enough to consider natural environments, like the ocean, simply as a natural system. This basic regard does not inspire ethical and political action. It is even not enough to dwell on endangered species and protected marine areas when incorporating civic issues, which is often a popular route when integrating socioscientific issues. Most likely this shift will start through an integrated science curriculum and a changed perception of the abilities of students, where teachers view their students as more than being able to pass standardized tests—as agents of equality and ecojustice within their community and for natural environments. Through this changed perspective, students may feel more confident in taking on a scientific and generous identity, while science teachers may feel less pressure to “teach to the test.” In consideration of these suggested changes, science teachers ought

to include issues that extend beyond this to address societal involvement, such as sea level rise, food and national security, public health, and extreme weather events. Through this shift, students can begin to see for themselves that it is more than the tuna population that is at stake, but our ecologically-influenced culture, ecological freedom, and ecological democracy if they fail to accept responsibility and act with erotic generosities.

Finally, throughout this dissertation I discussed the need for marine science education for all people across the country. I focused on comparable aquatic techniques for inland students, but I did not consider the possibilities of others way to experience marine environments and an erotic connection with the ocean. Two possible routes to investigating an erotic ethic for science education would be through the exploration of digital commons and within the science classroom itself. It could be argued that the digital world is a natural environment. If this is true, inland teachers can explore the uses of technology to effectively reveal the eroticism of the ocean (consider Google tools). Therefore, it might be worthwhile to consider the use of online social networking such as Facebook to connect with others across the country or even worldwide. For example, what are the implications of inland classrooms setting up their own Facebook group that they could use to discuss marine-related topics with other classrooms along the coastline, or to pose questions for their community regarding marine-related community issues? Students could even engage in social media gaming such as UWB Wetlands Restoration, in which players “maintain the biological diversity of the wetlands by obtaining up to 30 species of plants...and planting them in areas to support biological diversity in the wetland, all while fending off invasive plants” (Cook, 2012). Virtual gaming can be an excellent teaching opportunity, particularly when used appropriately. Using the



Farmville-esque game UWB Wetlands Restoration allows inland students to explore a marine ecosystem and understand biodiversity, while teaching restoration and succession in addition to donating a portion of any proceeds to actual wetlands restoration. Beyond social networking, teachers could set up a classroom blog to discuss or advocate for pertinent marine-related community matters. Video conferencing technology, such as Skype, provides a perfect venue for connecting with coastal classrooms, knowledgeable others, or oceanographers. Depending on internet accessibility, students could even video conference with students or oceanographers at or on the ocean to increase exposure. The appropriate use of technology can enhance the students' experiences with the ocean when they cannot physically be near it and can connect inland students with their community and coastal students and marine scientists in order to gain a better understanding of the ocean. Given these benefits, it would be interesting to consider the possibilities of a digital world enhancing or developing an erotic relationship with the natural world.

As previously described, the ocean is peaceful, healing, sensuous, comforting, and embracing. Perhaps an erotic ethic can bring those qualities of the ocean to students, whether the ocean is present or not. Slattery and Morris (1999) explains that this type of pedagogy is important, because it will allow students to make connections of the present to the past and push them forward to the future, where the future is open and uncertain. As I have discussed, an erotic relationship with the ocean can extend into science classrooms, regardless of proximity to the ocean. Perhaps in instances when even authentic inquiry is not always a possibility, teachers create an 'ocean' in their classroom using the erotic ethic outlined by Beauvoir. This ocean can serve as a model for students to practice freedom and ambiguity, lessons they need when they transition into the adult

world. Teachers can model mutual reciprocity of freedom in the classroom by viewing their students as free, not as objects in their classrooms. Through this model, students can learn the value of freedom not only for the ocean, but for all Others, and begin to understand how to grant this freedom themselves. As freedom is granted, students protect the Other from undue harm. Teachers can analyze the language they use in the classroom and be conscious of the use of gendered pronouns and patriarchal metaphors in reference to the ocean. In ungendering the ocean, the teacher acknowledges the ambiguous ocean. This ambiguous ocean can be erotic and subjective, not vulnerable to oppression or domination. As students recognize the ambiguity of the ocean, they see the ocean Other as having possibilities for spontaneity. In this recognition, the student can view the ocean as free so that its end is freedom. The students can realize through this freedom that they must act with the ocean and Others to ensure the ocean continues to have such possibilities, and reject any desires that would harm or negate the ocean Other's freedom.

Beauvoir links the body and morality in challenging Descartes' notion of the body as a machine. If the body is to be treated as a machine, promoting boredom and repetition, the lived body is subject to oppression. "Envisioning the body as a mechanism inaugurates a certain callousness which becomes the support of institutions that ignore the intentional realities of the body" (Bergoffen, 1997, p. 31). This callousness can lead to oppression in much the same way that patriarchy prevents women from the "possibilities of their subjectivity" (p. 31). Science teachers and students can break the chains of patriarchy through an erotic ethic by rejecting objectification of the Other and demanding a lived embodiment in their classroom. In order for students to experience freedom and embrace ambiguity, their bodies should not be mechanized, subject to

boredom and repetition in a daily routine. Teachers should given the opportunity to experience the world around them, but in that opportunity, grant freedom to the Other because they are free themselves.

Through their lived experiences, students actively engage in the world over. According to Beauvoir (1948), we actively engage in the world to experience freedom. As something acted out, freedom of an erotic ethic should inspire action of value for the Other. This action will require “a pedagogy whereby educators explicitly connect student experience to the subject of study in the present moment in such a way that the past and the future are open, emerging, and in process” (Slattery & Morris, 1999, p. 30). Freedom must be based on ambiguity, not certainty. Henriksen wrote of the erotic as “open and opening, not closed and closing; love is always becoming and not mere being” (2010, p. 225). Just as plunging into the deep unknown of the ocean, “descent into the depths of consciousness necessitates a fluid and changing self, the dissolving of solidity and form into new energies for life, an openness to mysteries both within the self and beyond” (Victorin-Vangerud, 2007, p. 175). In science classes, students should be encouraged to embrace ambiguity and plunge into the unknown in order to experience freedom and open themselves to new experiences for spontaneity and action. This freedom should be particularly true when engaging in laboratory activities or through interactions with nature and the ocean, so as not to confine the results, nature, or ocean, thereby ensuring the possibilities of their ambiguity. Experiencing their science class in this way may allow the consciousness of the students to expand as well, as they would themselves be open to the possibilities of their ambiguity.



Figure 10. Revealing the eroticism of the ocean

There are many ways to develop an erotic ethic for the conservation and care of Others, including the ocean Other, in science education. Though I mentioned previously that an erotic ethic can be extended to all Others, including other natural environments, I explain here why it is particularly important for the ocean Other. We are only borrowing this planet for but the slightest speck of time in the grand scale of its existence, from the past into its unimaginable future. It is even unimaginable to consider what will happen if we do not act now for the sake of our oceans, our planet, and this life, but we can estimate that it does not bode well for our children, their children—all future generations. In consideration of Beauvoir's erotic ethic, it is our responsibility to act. In our erotic relationship with the sea, we know it is our duty. When I am at the ocean, I feel it in my bones, coursing through my veins, and filling my lungs. This feeling is not entirely selfish but shared. Although mutual reciprocity requires that my granting of freedom to the Other in turn grants my freedom, the desire comes from an understanding of the value of the Other, including future generations. Both of my sons were born in February, separated by two years. In the summer following our oldest son's birth, my husband and I

took him to the same beach my parents had taken me as a child, and my mother's parents had taken her. His first experience with the ocean was actually in the bay, where various marine organisms are born and nurtured until they are ready to move on to the tougher, less protected waters of their adolescence and adulthood. On the day our son first met the ocean, my husband and I walked down the path to the bay, with our son in my arms. The path is gravel and sand, the sun was warm and bright, and the water whispered against the shoreline. We were fully clothed, but our son wore only a diaper. We walked out into the water, and though it barely reached our knees, we stood there with our son and soaked it in. The sun reflected little sparkles across the water's surface. Sea gulls landed on a dock nearby. Seaweed danced across our toes. Our son was restless, as he usually was. He had reflux in those early months, and as new parents, my husband and I experienced many moments of frustration and desperation over his discomfort and unhappiness. Perhaps selfishly, despite his fussiness that day, we dipped him in the bay. To our amazement, he immediately fell asleep. Maybe he could no longer fight the exhaustion, or it could be that he had been calmed by the perfect lullaby. Whatever the case, we were overwhelmed by the moment and the synaesthesia of the bay, and we openly cried. In that moment on that day in the bay, we promised our son that we would protect him, help him assume his ambiguity, and dedicate our lives to helping him find meaning in his. As we walked out of the water, we felt as though the ocean was repeating our promises. The ocean beckons to us and asks for our care and an intimate connection. In turn, it promises the same. It is our responsibility, as science educators, to help our youth more fully reveal and protect the eroticism of the Other.

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