

CRENULATION & TENTACULARITY:

An exploration of ceramics as a tool for communicating marine conservation topics

by

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The ocean is a fascinating, three-dimensional environment that contains diverse organisms and unique interactions. It is also a common source of inspiration for aesthetics. Unfortunately, marine ecosystems have been negatively impacted by human activities. Art can be a powerful tool for communication, especially when being utilized to translate scientific ideas. The body of work presented in this paper represents the use of clay as a medium for communicating the beauty of the ocean and the need for marine conservation.

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by

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GLOSSARY

Anthropogenic: caused or influenced by humans

Bathymetric: referring to the depth contours of the ocean

Benthos: organism living on or in the sea bottom

Bivalve: a mollusk with two shells attached at a hinge

(coral) bleaching: process in which zooxanthellae are expelled from the tissue of coral exposing the white skeletal structure beneath

Commensalism: symbiotic relationship in which one organism benefits while the other is unharmed

Ecosystem: organisms and their interactions with one another within to environment to which they are adapted

Intertidal: the area along a shore that falls between high and low tide; also the transitional zone from marine to terrestrial

Mollusk: group of soft-bodied invertebrates including snails, bivalves, and cephalopods

Mutualism: symbiotic relationship in which both organisms benefit

Nacre: smooth, pearly interior of many shells

Native species: an endemic species which is typically found in a specific ecosystem

Parasitism: association in which one organism lives in or on another for its benefit while causing detriment to the other species

Salinity: the amount of dissolved material in seawater

Symbiosis: an association between organisms which is typically beneficial to one or both

Zooxanthellae: dinoflagellates which can be found in the tissue of coral where they have a symbiotic relationship with the host organism

THESIS STATEMENT

The natural world has served as a source of inspiration for aesthetics and design. There is, however, a disconnect between humans and nature, a separation in which our dependency and connection to the environment are ignored resulting in a detriment to us and to the natural world. So how does one make others care about something that is unseen and unexperienced? Art provides an initial opportunity to create visual appeal and to draw viewers in, no previous experience or knowledge required. This first step can introduce the complexity of the ocean and its interactions in a digestible manner allowing participants to understand larger concepts. This new understanding reveals connections to nature that we can learn to value.

Through my research and academic efforts, I am exploring the use of art to communicate scientific concepts to the public. By using clay to show the beauty and intrigue of the ocean, an opportunity is created to reveal the complexity of the marine world and establish a connection. That connection further develops appreciation which can lead to conservation.

INTRODUCTION

The Ocean

On this planet, the land is arguably the domain of humans. This generally flat terrain, however, only encompasses about one-third of the surface of the earth. Surrounding its boundaries is the vast and deep ocean. In comparison to solid and sedentary land, the sea is dynamic and three-dimensional. Its fluidity supports the movement of some of the largest and the smallest organisms and the movement of currents that direct and stabilize the climate (Nybakken and Bertness 34-35; Concise Encyclopedia of the Ocean 42-43).

An interesting attribute often seen in marine organisms is the diversity of life cycles and body forms. Many larval stages have body forms that are vastly different from the adult stages. These larvae float throughout the water column until becoming juveniles and reaching maturity at which point they become established in whatever habitat their adult-forms thrive. Unlike many land animals, these larval stages are unrecognizable in form compared to the adults and often undergo multiple, dynamic, metamorphoses of form (Nybakken and Bertness 42-58).

These diverse body forms also parallel the various habitats that are found within the ocean. Survival in these marine environments requires a vast number of interactions between organisms, known as symbioses. Commensalism occurs when one animal lives on another, or in its abode without negatively impacting the host. Mutualism is a mutually beneficial relationship between two organisms. On the other hand, parasitism occurs when one organism negatively impacts another by living on or in it. These relationships highlight the dynamic interactions between organisms and their habitats (Nybakken and Bertness 475-477).

As a liquid medium filling a vast and deep expanse, the ocean also contains many organisms that migrate seamlessly throughout its various layers. These migrations can encompass predominantly horizontal movement, such as with whales who travel thousands of miles to give birth in warmer water

before moving back to cooler and more nutrient-dense regions. The depth of the ocean also permits vertical migration, which can occur on a daily basis. Plankton, for example, spend the day in deeper water where predation is minimal. At night, they migrate upwards towards the surface, traveling distances that are magnitudes larger than their microscopic bodies (Concise Encyclopedia of the Ocean 104). Although similar migrations occur on land – especially with bird species – the movement is typically still dependent on being close to masses of land and seems rather two-dimensional in comparison to the migrations happening under water.

As a medium that permits movement and suspension more easily than air, water also exhibits hydrological characteristics that dictate how organisms interact with it and how it interacts with its surroundings. Currents – which are activated by the temperature and associated density of seawater along with the physical impact of the wind – drive the movement of nutrients, organisms, and temperature throughout the global expanse of the ocean. Waves create movement and tenuous uncertainty at the surface of the water, interacting most often with the boundary between land and sea. And in every one of these fluid habitats, life can be found (Concise Encyclopedia of the Ocean 40-41).

Despite its expansive size and global reach, the ocean is under threat by anthropogenic activities. Overfishing and destructive fishing practices have led to a significant decline in the population of many marine organisms (Jackson, et al.). Coastal development and activities have destroyed and degraded marine habitats, including those that provide protection from storms (Bayraktarov, et al.). Our increased ability to travel on the water and exploit its resources has led to oil spills (Chang, et al.) and an increase in noise pollution (Middel and Verones). Overproduction, excessive use, and poor waste management strategies have resulted in the accumulation of garbage, including a staggering amount of plastic pollution that does not biodegrade (Haward). The list of threats is disparagingly long and complicated. Although, as a whole, we are learning to acknowledge ourselves as the sources of these problems, communicating the severity and implementing the necessary changes has become a global challenge.

Art as a Tool for Communication

Science is notorious for being complex and there is a divide between the research being completed and how it is being disseminated to a non-scientific audience. Art is already used in research, particularly with the creation of graphs and infographics. These visual representations of data help to show trends, relationships, and environmental dynamics in small, digestible units (Tufte 9-10, Tufte 9-13). Edward Tufte summarizes this notion with the concise phrase, “Graphics reveal data” (Tufte 9-13). This process can similarly be used to explain scientific concepts and ideas to a public audience and to stakeholders, including policymakers. Additionally, art can elicit an emotional response. When considering efforts to educate about the need for environmental conservation, this emotional response can be especially effective at sustaining interest and efforts in making necessary changes.

The natural world, particularly within the ocean, is multidimensional and dynamic. Ceramics lends itself to the replication and portrayal of marine environments, organisms, and interactions and the finished piece, visually and conceptually, has the capability of communicating a meaning deeper than function, science, or aesthetics. My interest in marine conservation and ceramics provides an interdisciplinary approach to communicating science, addressing these environmental issues, and highlighting applicable and feasible solutions.

History and Relevance of Clay

The use of clay has had a major global impact on culture and habitation. As a natural material created from the wearing down of rock, clay bodies are present in regions around the world. Many cultures have discovered and benefited from the use of ceramic materials. Once firing was introduced, and ceramic ware became a reliable substance for making food storage vessels, people were able to better colonize regions due to food security. Clay has also been used extensively to build abodes and infrastructure that have further supported civilization. Utilitarian ware has exhibited extensive variations

in form, function, and surface design. Many figural and spiritual pieces have been found and utilized by cultures. In contemporary times, the material is also heavily used in domestic activities, including tiles, commodes, and dinnerware. It is also a fine art and craft medium that utilizes numerous glaze recipes and firing techniques to create pieces (Pitelka 1-8; Speight 8-17; Staubach xi-xv, 19-43).

SPECIFIC AIMS

Creation of Forms

As I approached this project, I determined that I did not want to merely replicate organisms from the marine environment. Although some recognizable organisms are present or serve as inspiration for elements of the form, I wanted to focus on portraying relationships and interactions. When considering conservation, it is not just about protecting an animal. It is necessary to understand and protect that animal's environment, its interactions, and the role it plays in the greater ecosystem. Therefore, I designed pieces that showcased those interactions and also highlighted the resiliency and the fragility of the ocean.

Many of my works involve the interaction of individual pieces that create a larger structure. This construction mimics what is often seen in marine organisms, such as barnacles, oysters, and corals. These organisms create their own hard substrates and build off of other hard substrates, including the bodies of one another, to create a durable and thriving community that supports numerous other species. These habitats can take significant time to develop, but once established, they become critical to the survival of their associated species. Humans, too, benefit from these ecosystems. For me, as I was building these forms, I found that even the act of creating these modular pieces with repetitive forms was time consuming and there was always a nagging concern that the composition may not survive firing. There was an eerie similarity to the time and effort needed to create marine ecosystems compared to the ease with which they can be destroyed by human activities.

Other pieces were created to highlight environmental conditions and body forms that survive well in the ocean. These forms were commonly created with soft slabs of clay so that the resulting folds and ripples mimicked the organic forms often seen in soft-bodied ocean creatures such as nudibranchs. In the dynamic and fluid ocean, organisms need to withstand a number of factors that are not as prevalent on land. Many respond by having soft and mobile appendages that help them to move through the water.

Viewer Participation

Traditionally, art is placed on a pedestal and viewers are discouraged, and often prohibited, from directly touching or interacting with the pieces. Environmental conservation is similarly seen as a responsibility of the scientific experts who work within the field. Effective conservation, however, tends to be most successful when the community is directly involved. That participation helps to acknowledge the impact of individuals' choices and behaviors on larger issues. Similarly, I want viewers to participate in the creation of part of the exhibit. This tactile interaction with the pieces and the physical process of placing them alongside objects that other viewers have also placed emphasizes a personal and communal involvement in nature. Ecosystems support diverse groups of organisms that each have specific roles to play in order to survive. Similarly, we as individuals have a role to play within our community and within our environment.

CLAY AS A NATURAL ELEMENT AND AN ARTISTIC MEDIUM

Clay

Clay is a naturally-derived material produced from the weathering of rocks. This characteristic is especially intriguing because it has a strong connection to the environment. The clay sediment is created by the movement of water over rocks and with the reintroduction of water, a malleable medium is produced. With firing and glazing, the form can be made waterproof. It can withstand the elements and yet even if discarded, it does not pose a threat to the environment as it slowly breaks down (Pitelka 1-8; Speight 8-17; Staubach xi-xv).

The fine clay particulates have a high surface area:volume ratio, often forming platelets that stick together while still being able to slide across one another easily. These characteristics create plasticity and malleability, lending the medium to the creation of three-dimensional forms. The pieces can easily take on organic or geometric forms of various scales. The medium can also accept and hold pattern and texture well, allowing for extensive surface design options (Pitelka 1-8; Speight 8-17). Once fired, the clay is also capable of withstanding natural elements, including exposure to seawater. This is an important characteristic which has been utilized as part of the exhibition.

Clay and the process of glazing also share an interesting parallel to ocean organisms and processes. A naked clay body, especially porcelain, has a very similar consistency and appearance to the skeletons of marine organisms. The thin layer of colorful glaze which is added mimics the thin, living tissue which covers the surface of the skeletons and is responsible for interacting with the surrounding environment in a way in which the organism can survive. Coral skeletons, in particular, are very similar to fired porcelain. In the ocean, during times of duress and environmental stressors, corals will bleach – a process in which they expel zooxanthellae from their living tissue and turn white. These visual and tactile similarities between the ocean and the ceramic process made the medium a powerful enhancement to the overarching goal of the exhibit.

The glazes and firing processes used for the creation of the pieces were selected to mimic the palette of many marine ecosystems. There is an extensive array of colors, textures, and forms found in the ocean. Although there are bright colors found in the ocean, when we are submerged in the water, there is a slightly muted array of colors. In an effort to capture these elements and show the contrast between them, various colored glazes were used, including those that could be fired at cone 6 and cone 10 in order to achieve differences in glaze effects at varying temperatures. None of the colors selected were overly garish or bright. Soda firing was also used because the atmospheric firing process created patterns and colors that enhanced the ocean aesthetics and could not be achieved using any other firing process. Specific pieces, however, were left with the white clay body exposed to mimic the appearance of bleached organisms.

Finally, clay is commonly associated with utilitarian ware. Although the goal of my exhibition was not to directly create pieces that are considered utilitarian, many of the pieces still exhibit some of those characteristics. This was, in part, because viewers are meant to make a connection to the this material which is most commonly seen in a domestic setting. Domesticity is very much an environment created by humans. By using a material that inherently is associated with such activities and by creating some more recognizable forms, it enhances the understanding that human actions impact nature. The use of crocheted coral forms, for example, was an instance in which the process was selected because it yielded the desired results – a coral form which would be challenging to create through handbuilding was achieved by creating the form first in yarn and then applying slip to create the ceramic form – but also connected to domestic life. Through the process of creating this exhibition, it became evident that a connection to domesticity enhanced the message of human impact on the natural world.

Design Intent

One major issue with marine conservation is that the ocean, despite its size, is so far removed from most people's daily lives that it is difficult to express the severity of the threats impacting it. Many animals and environments found in the ocean are only seen digitally and are rarely experienced in the three-dimensionality of the marine environment. Additionally, it is hard to imagine the magnitude of so many organisms when most of our interactions on land are limited to a comparatively smaller number and size of organisms.

With my exhibit, I have created a three-dimensional world into which the viewers can enter. Pieces are displayed on low-lying pedestals, hung on the walls, and suspended from above to recreate the many layers of life found in the ocean. The locations help to reinforce the perspective of being submerged – like a diver – with forms below, beside, and above. Movement is a component of some pieces, helping to showcase and reinforce the dynamics of living in a fluid world. Additionally, certain pieces contain components with which the viewers can interact. The interaction reflects the interdependent relations found within the ocean and the fact that we as humans can have a significant and direct impact on the marine environment.

CRENULATION & TENTACULARITY

Exhibit Design

The exhibit is designed to create a submersive experience. Ceramic elements, which are typically presented on columnal pedestals, are positioned on low and faceted pedestals with pieces stretching beyond to the walls. The intent is to mimic the three-dimensionality and fluidity found within the marine environment. As humans, we are used to a flat, predominantly two-dimensional world. With this exhibit, I hope for viewers to look all around and start to understand the ease with which marine organisms interact with one another and with the elements of water.

The two interactive components of the exhibit – the sculptures on the nontraditional pedestals and the magnetic board – both mimic ecosystems that are dependent upon substrate-building organisms and serve as physical barriers that protect the coastline. Viewers get to interact with a coral-like community in which ceramic pieces are able to be inserted directly into an oil clay base so that the sculpture can be built up as more viewers add to it. The faceted pedestal is at a 45° angle which mimics the ideal angle at which certain reefs develop to ensure adequate light and gravitational assistance with the removal of sediment. The lower pedestals allow viewers to observe the pieces from above, similar to how a snorkeler or diver would view organisms in the ocean floor. The magnetic boards focus on the intertidal zones in which organisms, such as oysters and barnacles, adhere to and create structures that help to define that region. Again, viewers can interact by shifting the pieces around, mimicking the shifting of coastlines.

The third component of the exhibit is structured to fit a more traditional display. Ceramic pieces that relate to the idea of ocean conservation, but also exhibit traditional pottery forms, are displayed on traditional pedestals. Most of the pieces are porcelain and do not include a lot of color. This links back to the natural process of coral bleaching in which corals lose their symbiotic zooxanthellae resulting in a loss of color. Their white skeletons show in sharp contrast to the surroundings until the coral dies and other

organisms grow over the skeleton. This element is also meant to emphasize our tendency to place great value in art, to the extent that we place it upon a pedestal, and yet we often neglect to acknowledge or understand the value of the environment around us.

The final component, which is near both the entrance and the exit of the gallery, includes the ceramic sculptures that were placed underwater for a few months. They exhibit the growth of coastal organisms and highlight the resilience of these creatures and how we are interacting with them, consciously and unconsciously. The use of clay as a marine substrate is also linked to the use of ceramic material for research tiles used to gauge marine growth in a controlled and measurable manner. The use of ceramic material in marine research and as an art form creates yet another connection. There is potential – from both an artistic and scientific perspective – to further examine the potential use of a ceramic medium as a viable substrate for marine ecosystem restoration. It is yet another opportunity for the two disciplines to work together to further conservation efforts.

Although all of the pieces are designed to work together in one installation, consideration was given to their use beyond this initial exhibition. Although clay is a natural material, the process of creating, glazing, and firing ceramic ware requires extensive energy and the use of mined materials which have often been shipped great distances. From an environmental standpoint, ceramics is not always very eco-friendly. From an art perspective, individual works that are created for specific exhibitions may not have a purpose beyond that, creating potential waste. For these reasons, the pieces in my exhibition are designed to be shown in a group and individually. The magnetic pieces, in particular, can be separated out for purchase and/or display. In this way there is a second life for these pieces, a reuse that minimizes the long-term impact from a single-use design.

Public Participation

Viewers are not typically expected – or permitted – to interact with art directly in a gallery setting. I want viewers, however, to participate in the creation of part of the exhibit. In the ocean – as in many other environments – specific organisms actually live and grow together, creating substrates and communities that support a larger diversity of life. Allowing viewers to interact with the pieces and to help build a sculpture is intended to highlight our connection to the environment, and our potential impact on it. The ocean, in particular, is not an environment most people interact with directly. Most of our experience involves the edges or the surface of the water. This direct interaction with an “underwater” world is meant to help viewers make a stronger connection. Some elements of the sculptures are more strongly representational of ocean organisms, but the focus is not on recreating the marine environment, rather it is intended to help the audience see it differently.

Description of Pieces

Symbioses



PLATE 1: *Symbioses*

Photo Credit: Morgan Zichettella

This piece epitomizes the three-dimensional quality of the ocean. Two round pedestals sit 8 inches off of the ground. Multiple organic and undulating forms fit together on the surface of the pedestals with a puzzle-like interaction. The curving edges and rims parallel neighboring pieces similarly to how the growth and form of many marine organisms adjust to fit the elements around them. The pieces are not attached to the pedestal and therefore can be moved and rearranged at the discretion of the viewer.

The main, faceted pedestal is suspended on the wall. It slants towards the viewer at a 45o angle, mimicking the ideal angle of many reefs which develop to ensure adequate light and gravitational assistance with the removal of sediment (Sheppard, et al. 30). The base slants back towards the wall so that viewers can get close to the top where a foil base and layer of oil clay create a surface indicative of marine benthos. The malleable layer also permits ceramic pieces attached to upholstery tacks to be

securely moved and placed so that viewers can “build” a reef environment. These small ceramics pieces have designs based on coral textures and other marine organisms found in reef ecosystems.



PLATE 2: *Symbioses* – Detail of moveable pieces of clay on oil-clay base.

Photo Credit: Morgan Zichettella



PLATE 3: *Symbioses* – Detail of moveable ceramic pieces.

Photo Credit: Morgan Zichettella

As the initial piece in the exhibit, it serves as a bathymetric starting point for the viewers by representing a totally submerged ecosystem. The low pedestals allow participants to view the pieces as if they were swimming above them. The viewers then move onto pieces that represent coastal zones and human interactions with those regions.



PLATE 4: *Symbioses* – Detail of moveable organic forms on lowered pedestals..

Photo Credit: Morgan Zichettella

Currents

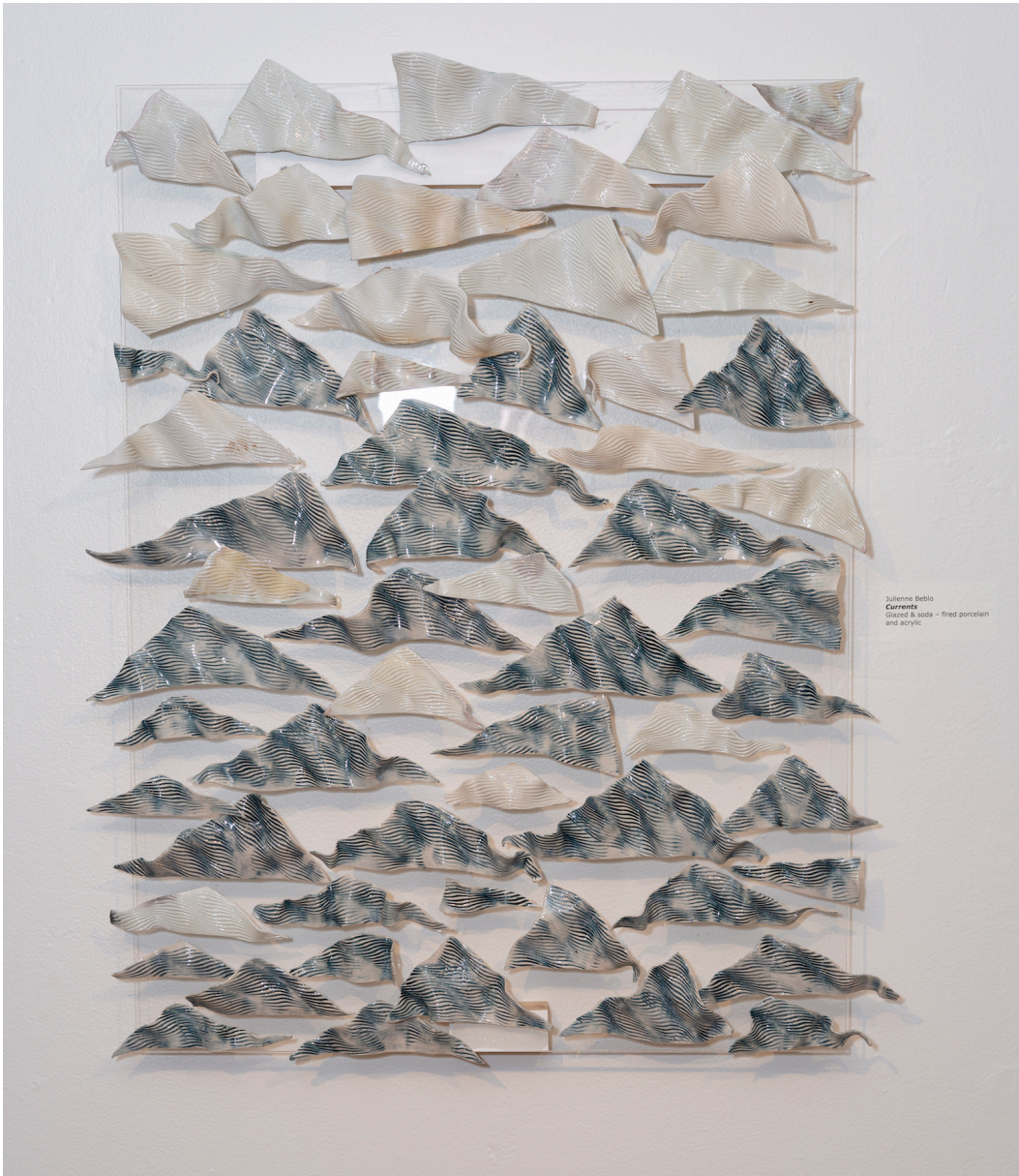


PLATE 5: *Currents*

Photo Credit: Morgan Zichettella

This piece emulates the movement and verticality experienced in the ocean and helps to transition the viewer from the deeper, offshore coral ecosystem to coastal regions where currents and wave action start to shape the land. Triangular pieces of undulating porcelain with a repetitive, wavy texture are

adhered to a piece of acrylic. The detail of the texture is emphasized with the use of blue-green underglaze. The pieces overlap slightly creating gaps that reveal the wall behind the piece. With the gallery lights shining, shadows are seen through the acrylic, mimicking the play of light rays as they penetrate the surface of the ocean.

The movement of water in the ocean is vital to the survival of marine organisms and impacts the weather experienced on land. It varies in temperature, salinity, oxygen levels, and concentration of nutrients. Additionally, depending on the light level and depth of the water, it displays an array of different colors (Concise Encyclopedia of the Ocean 38-43). The elements of this piece capture the subtle shifts in color and imply the movements experienced while suspended in water.



PLATE 6: *Currents* – Detail of textures and dimensionality of ceramic pieces.

Photo Credit: Morgan Zichettella

Unhinged Nacre



PLATE 7: *Unhinged Nacre*

Photo Credit: Morgan Zichettella

Nacre is the iridescent, smooth layer often found inside mollusk shells. It is an interesting juxtaposition when compared to the often rugged and “dirty” exterior of shells. This piece is created with very thin sheets of clay that have been manipulated to emulate the textured and often razor-sharp forms of bivalve shells. These forms, often seen in organisms such as barnacles, are repeated on the sphere-base. The overlap of elements mimics the growth of marine organisms which will often settle and grow next to, or on top of, one another. This community structure is often strengthened by the overlapping growth, but there is always potential for elements to break away.

This piece represents the numerous coastal organisms with which humans often interact. These species – which are found in dynamic coastal ecosystems and are also easily accessible to humans on foot and in watercraft – are resilient. Many have traits which permit them to survive in conditions that oscillate between dry, salty, and submerged as the tides change. The single pieces of porcelain which are unattached hint at the susceptibility of these organisms to destruction, despite their inherent resilience.



PLATE 8: *Unhinged Nacre* – Detail of piece.

Photo Credit: Morgan Zichettella

Tidal Cycle



CAUTION: This installation utilizes strong, rare-earth magnets that should not be handled by those with pacemakers.

CAUTION: This installation utilizes strong, rare-earth magnets that should not be handled by those with pacemakers.

PLATE 9: *Tidal Cycle*

Photo Credit: Morgan Zichettella

The magnetic boards of this piece create another opportunity for viewer participation. Individual ceramic pieces, which showcase representational forms – such as barnacles – and other textures and forms

that parallel marine organisms found in coastal and intertidal zones are adhered to rare-earth magnets. This allows the individual pieces to be moved around the boards, emulating the constantly changing coastal zones in which many hardy marine organisms live. The manipulation of pieces also relates to how human behavior and interactions can impact these coastal ecosystems, reminding viewers that their choices have far-reaching effects on the ocean.

Coastal regions, including docks and pilings which have been constructed for human activities, are also habitats for many of these organisms. Humans can easily interact with them, often in an effort to collect them for food or to remove them from our structures. And yet, they persist. This interactive display also helps to reaffirm the resilience of these marine organisms as they fight to inhabit and thrive in these ecosystems.



PLATE 10: *Tidal Cycle* – Time-lapse of movement of magnetic ceramic pieces

January 18, 2021



PLATE 11: *Tidal Cycle* – Time-lapse of movement of magnetic ceramic pieces

January 27, 2021

Limited Bounty



PLATE 12: *Limited Bounty*

The main form of this piece is loosely based on an abstracted form of a boat. The exterior texture is the same utilized in “Currents”, emulating similar wave-like imagery and showing a connection between the pieces. The dripping blue glaze on the exterior hints directly at water and connects to our common interaction with the ocean at its surface. The colorful but dwindling dots in the interior, enhanced by underglaze, represent our reliance on the ocean for sustenance and highlight the fact that there is a limit to this bounty. This piece also leads into the section of the exhibit which focuses on human development and its impact on the marine world.

Encrusted



PLATE 13: *Encrusted*

Photo Credit: Morgan Zichettella

This piece represents a significant shift towards the traditional method of displaying ceramic pieces and towards an ocean world devoid of color. The sphere-base is covered in thin, spaghetti-like extrusions of clay which create an intricate and undulating texture. On the surface, forms have been created using porcelain slip pushed through icing-tips. Subtle color is added with underglaze, but the overall appearance of the piece is a muted white. The forms harken back to the textures and forms already utilized in the exhibition but begin to show an element of control and restraint indicative of human involvement.

Bleached Crenulation



PLATE 14: *Bleached Crenulation*

Photo Credit: Morgan Zichettella

The individual forms in this piece were created by first making the wavy, bowl-like forms. Blue and green marbles were then placed in the pieces and soda-fired. The marbles melt to create a colored interior while the remainder of the form takes on the dappled and subtle variations resulting from soda-fire. The undulating pieces were then puzzled together and adhered to a porcelain dome. The overall form is similar to many coral structures, but it exhibits a loss of color that again emulates the devastating impact of bleaching on reef systems.



PLATE 15: *Bleached Crenulation* – Detail of ceramic pieces with melted glass marble centers.

Photo Credit: Morgan Zichettella

Calcified



PLATE 16: *Calcified*

Photo Credit: Morgan Zichettella

This porcelain bowl is decorated with a slip design that mimics the interior compartments of a nautilus shell. The chambers gradually get larger as they move away from the whorled core of the organism's shell and the Fibonacci sequence pattern can only be seen when the shell is bisected. Therefore, the pattern can only be seen when the living organism is removed. The effect of soda-firing creates a glassy glaze with a green hue in areas where the soda-solution settled more heavily. As a whole, the piece is devoid of color and encapsulates an empty, broken shell, hinting at the degradation of the ocean by human activities.

ResilienSea



PLATE 17: *ResilienSea*

Photo Credit: Morgan Zichettella

These pieces are separate from the main exhibit and were created using an unglazed, high-fire clay body that is commonly used in outdoor sculptures. They are ceramic sculptures created with patterns and forms that were used in other elements of the exhibition – the wavy texture and the spaghetti-like extrusions – as well as perforated forms. They were specifically designed to create more complex substrates onto which it was theorized that the marine organisms would be able to colonize. The pieces

were placed in a field site in the Rachel Carson Reserve which is currently permitted for use by Dr. Rachel Gittman and her lab. The pieces were left in the water for about three months before removal and cleaning.

As elements of the exhibit, they are the only pieces covered by vitrines. This was in part due to the sharp edges found on the organisms but it also serves to support and enhance the message of the exhibition. We as humans tend to venerate art by placing it on a pedestal in a gallery in which its value is implied by its treatment. Rarely, however, do we do this for nature despite the fact that our survival is dependent upon the continuance of the natural world. By placing the only pieces that show a direct interaction between marine life and human activity separate and protected from disturbance, the concept of valuing and conserving nature is highlighted.

An interesting outcome is that the organisms that colonized the ceramic sculptures tended to be native species, including the striped barnacle (*Balanus amphitrite*), the ivory barnacle (*Balanus eburneus*), the Eastern oyster (*Crassostrea virginica*), and the scorched mussel (*Brachiidontes exustus*). Although the main impetus was to create sculptures specifically to go into the marine environment, a second goal was to see if the ceramic medium would prove to be an adequate substrate for marine growth. With the amount of life that inhabited the sculptures within the time that they were in the water, it is indicated that there could be a potential use for clay in research and restoration efforts.



PLATE 18: *ResilienSea* – Detail of marine growth.

Photo Credit: Morgan Zichettella



PLATE 19: *ResilienSea* – Detail of marine growth.

Photo Credit: Morgan Zichettella

CONCLUSION

Humans have a tendency to try and fit nature into our created parameters but in doing so, we often ignore or inhibit its greatest potentials. As we are experiencing and witnessing the impacts of unfettered human activities, however, there is growing understanding that we can better protect and conserve the natural world. This does not have to only be directed by those directly researching and examining these impacts. Everyone can have a positive impact on these changes and art is a critical component instigating the change. As a tool for communication, art has the power to help support conservation efforts by engaging participants from various backgrounds and disciplines. Large scale initiatives, such as marine conservation efforts, need support from all avenues. By utilizing the potential of art to influence social change, we can improve our efforts to conserve the ocean and create a better harmony with nature.



PLATE 20: *Image of Exhibition*

Photo Credit: Morgan Zichettella

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APPENDIX A

MATERIAL SELECTION AND PROCESS

Clay Bodies

I selected porcelain and stoneware to create my pieces. Porcelain is especially suited for creating very thin, even translucent forms. Additionally, its white coloring is maintained even at high-fire temperatures and offers a similar parallel to the white, calcareous skeletons found in corals, which were prominent inspirations for my work. Stoneware was useful for slabwork and sculptural elements. Both clay bodies produced desirable results from atmospheric firing and glazing processes that further supported the creation of ocean-inspired forms.

Firing

Soda-firing is an atmospheric firing process in which a soda-solution is introduced when the kiln has reached the desired temperature. The process creates a unique, often mottled glaze on the surface of the wares. Different clay bodies result in slightly different effects Porcelain takes on some brown and light to dark grey hues with dappling, depending upon base components. Stoneware tends to exhibit a reddish-brown hue with grey dappling with some clay bodies turning a darker, chocolate-like brown. The effects on different clay bodies were of special interest for my project because many of them created textures and patterns that were very similar to those found in the marine environment. In this way, the firing processes selected were utilized to further enhance and support the research.

Burnout firing was utilized to create some of the coral forms. The forms were initially created by crocheting. The resulting plush forms were dipped in slip and allowed to dry before slowly firing them. The burnout process literally burns the underlying crocheted structure leaving a thin, ceramic shell. The process permits the creation of forms that would be difficult to achieve through handbuilding. It also often preserves textures and evidence of the initial form, including the lines and texture indicative of yarn.

Glazing and Surface Enhancement

Although atmospheric firing was used to create specific glaze effects on some of the pieces, traditional application of glaze after bisque-firing was also used to achieve the desired colors and patterns. Cone 6 and Cone 10 glazes were both used depending on the results needed for the work. Underglazes, oxides, and colorants were utilized to enhance the applied textures on the pieces and to add additional color elements reflective of the myriad of colors found in the ocean and its inhabitants.

APPENDIX B

INFLUENCES

With my interest in both art and marine science, I am influenced by those who make an effort to find connection between both disciplines. Artist Courtney Mattison has worked extensively with Mission Blue, a nonprofit focused on protecting the oceans. Her work has primarily involved the creation of coral reefs out of clay. Her pieces are displayed in various locations of prominence and serve as vivid and visual reminders of these ocean organisms, while also highlighting the need to protect them. Edward Tufte, a professor at Yale University, has written multiple books concerning the visual representation of scientific data and how combining the two disciplines is more effective than simply presenting the raw data. It is so effective because data is easier to understand when it is presented in a visual format.

