OUR STORIED SEA:

CRAFTING A COLLECTIVE NARRATIVE OF THE OCEAN

THROUGH ACCOMPANIMENT

by

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DEDICATION

I dedicate this dissertation to my parents, Hilda and Ben Scaralia who instilled in me a fierce love for nature, the value of paying it forward, and the knowledge that when art and science are allowed to mingle through storytelling, a powerful alchemy results.

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GLOSSARY

Aotearoa: Maori name for New Zealand.

Haka: The haka is a traditional war cry, posture dance, or challenge from the Māori people of New Zealand that involves the slapping of the chest, the stamping of the feet and chanting.

Karanga: A karanga is a call out or summon that is an element of cultural protocol of the New Zealand Māori people. It is an exchange of calls that forms part of the *powhiri*, a Māori welcoming ceremony. It takes place as a visiting group moves onto the *marae* or the formal meeting area. Karanga are carried out almost exclusively by women and in Māori language, and are initiated by the hosts, and responded to by the visitors.

Mana: Māori word for Spirit.

Te Mana o te Moana: Māori saying, which means "The Spirit of the Ocean."

Tupuna: Māori word for Ancestor.

Vaka (also Waka, Wa'a, Va'a): Traditional double-hulled Polynesian style voyaging canoe.

ABSTRACT

Never before have we had such broad access to scientific information about the sea, yet as the world's oceans slip into a state of crisis, the American public's grasp of the issues is far from firm. But how do we begin to understand something as vast as the ocean, an area that covers more than two-thirds of our planet, when less than ten-percent of it has been explored? The ocean we "know" represents many things to many people; for some, it is a realm to be feared, for others, it is a resource to be exploited, and yet for others, it is a home to protect.

This dissertation tracks an ever-evolving narrative of the ocean and examines how we come to infuse it with meaning. I contend that many Westerners relate to this *space* that we call the sea as a *place* not through a personal history, but via a translated history by those who have conveyed that experience to the public through visual storytelling. As we have been primarily on the receiving end of narratives "owned" and dictated by select voices, I argue there has remained a disconnect with the sea that has troubled our relationship with it. In today's rapidly expanding media landscape, we now have the opportunity to participate in the ocean's story as never before. I propose we disrupt the notion of "narrative ownership" as it may serve to limit understanding, and turn instead to a shared narrative that embraces diverse perspectives in order to broaden our depth of knowledge and our relationship with the sea.

Further, this work examines the ways in which the shifting digital and social media terrain is enabling ocean scientists to blur the lines between science and advocacy in order to invest the public in stewardship. I argue that in order to be effective, the science narrative can no longer simply inform; it must engage the public by incorporating human agency into the story of the ocean. Only when we share a collective narrative of the ocean, will we be able to fully invest in its protection.

To that end, I explore how the confluence of science, storytelling and the human experience has culminated in my establishment of the non-profit organization, the Ocean Media Institute which serves to expand the public's understanding of ocean science through the collaborative creation and open distribution of innovative visual media and artistic approaches to ocean literacy.

INTRODUCTION

From Ocean to Mountain and Back Again

They say there are ocean people and mountain people. As a filmmaker, environmental biologist, and storyteller, I have chosen to perch myself at the intersection of both. In the summer of 2010, I was living in New York City and working as a natural history film producer and writer when I was invited to Montana State University to teach in their MFA program for Science and Natural History Filmmaking. Just as I was planning my move to the mountain-ringed town of Bozeman, I was offered a job to write and story produce a feature-length documentary about the ocean. The project sounded incredible -- we would be chronicling the voyage of over 100 South Pacific Islanders who were to sail and celestially navigate a fleet of Polynesian voyaging canoes on a two-year, 20,000-mile journey across the Pacific in order to carry a message about the ocean's health to the world. There was absolutely no hesitation in my response. I was on board.

Having grown up in the "Ocean State" of Rhode Island, if there was one language I thought I understood well, it was that of the sea. I was excited by her rant through a storm, and soothed by her easy lullaby on a quiet summer night. When I moved to New York, I sought out that familiar voice to cut through the noise. Whether taking a walk across the Brooklyn Bridge, strolling the Boardwalk on Coney Island, or dipping my toes in the Atlantic at Rockaway Beach, the voice of the ocean was a constant companion, one that anchored me.

With a move to Montana, I had expected that voice to be hushed. The nearest

coastline would now be a thousand miles away. But at least I would have my film to get my occasional dose of "blue noise."

Over the course of the next few years, I kept one foot planted on mountain and the other dipped in ocean, toggling between teaching natural history production in the heart of the Rockies and sailing with the Pacific Voyagers (as they would come to be known) across that great blue universe of water, learning all I could from them. As we made our way across the Pacific from New Zealand to Tahiti, Hawaii to California, Cocos to the Solomon Islands, a story of connection began to emerge, as ancient as it is modern, as sacred as it is scientific.

I soon met Tua Pittman, the Master Navigator from the Cook Islands, who became a main character in our film and one of my dearest friends. He explained what it meant to him to be a citizen -- and steward -- of the ocean. He taught me about the importance of the canoe in South Pacific culture. "We have a saying: *'He va'a he moku, he moku he va'a,'* which means, *'The canoe is our island, and the island is our canoe.'"* He then showed me a large stone set at the base of the mast and explained that it was a *mauri stone* -- a rock from his home that would accompany them on the entire journey and remind them of the connection between land and sea. As he spoke, I began to understand. The canoe was not simply a vessel that moves people from place to place, but a microcosm of the planet -- a place of limited resources where people must work together and live sustainably in order to survive. And with that, we had our film's title: *Our Blue Canoe*.[1]

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[1] *Our Blue Canoe* is a feature length film produced by *Okeanos Foundation for the Sea*

Through the film we come to relate to the ocean in all its power and fragility via the experience of these intrepid sailors. Together, we revel in the company of Blue whales, and curse the raft of plastic beneath the swells. We brace ourselves through feral storms, and celebrate safe arrivals on remote and wild shores. As our Pacific crewmates open their lives and their culture to us with humor and grace, heartbreak and hope, we discover their journey echoes our journey; their dreams reflect our dreams – their story and our story weave together. And at the heart of their message rests the notion that this ocean is not a barrier that separates our islands, our nations, and continents, but rather the bridge that links us all.

And that was perhaps the most important lesson that I carried back to Bozeman; and though I didn't know it at the time, it was the germ of this dissertation. The ocean is not confined to that blue expanse beyond the land's edge. Even in my land-locked state, the language of the ocean is communicated in rich, full verse. Though not heard through the pounding of surf or lapping of waves, here in the mountains, the ocean sings in a different register. It pings across the ice of a blue-white glacier and rasps in the whirling diamond dust on a sub-zero morning. The ocean is, in fact, as close as the clouds that fringe the peaks, as common as fresh snowfall on the towering spruce, as much a part of us as our every second breath.

We often think in terms of what separates us: our religion, our color, our land, our language. We tend to frame our lives in the context of "boundaries." But if there is one thing that I have learned since moving from sea-level to five-thousand feet, it's that nothing is truly isolated. Everything is interconnected, interdependent. Mountain needs

ocean as bone needs blood, as modern society needs ancient wisdom, as science needs story.

This dissertation examines how Americans infuse the ocean with meaning drawn from history and memory, and thus construct its story. I contend that most Americans have come to relate to this *space* that we call the deep ocean, as a *place* not through a personal history, but via a translated history of those who have had direct experience with it and who have conveyed that experience to the public viscerally, through visual storytelling. I will explore how that interpreted experience evolves into one that is adopted by the public and argue that we invest in only what we understand as real -- and what we see often influences that reality. Most emphatically, I contend that the power of science is held within the vessel of story and we need powerful stories to convey science effectively. I posit that as more marine scientists incorporate visual media into their work and include the public in the narrative, we will gain a greater appreciation of the deep ocean as a real place with real issues that require real response.

Spinning Science to Story

We have arranged a global civilization in which most crucial elements profoundly depend on science and technology. We have also arranged things so that almost no one understands science and technology. This is a prescription for disaster. We might get away with it for a while, but sooner or later this combustible mixture of ignorance and power is going to blow up in our faces. (Carl Sagan)[2]

In July of 2013, I found myself sitting amid a roomful of top marine scientists at the first-ever National Forum on Ocean Exploration held at the Aquarium of the Pacific in Long Beach, CA. Some of the most brilliant minds in ocean science and technology had assembled by request of the U.S. government to discuss and draft a National Plan for Ocean Exploration.[3] In attendance were such luminaries as the legendary marine scientists and explorers, Drs. Sylvia Earle and Don Walsh; the creator of Google Earth, Michael Jones; and more than 100 other ocean scientists, educators, and communicators.

A recurring topic of discussion focused on the way ocean science was being conveyed to the layperson. Scientists bemoaned that funding for ocean exploration had been dwindling due in part because the American public possessed little connection to ocean science and were unable to grasp the weight of issues such as ocean acidification, coral bleaching, or sea level rise -- issues that many argue reside outside the everyday experience of most Americans and are therefore off the radar. But, I wonder, is this true?

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[2] Carl Sagan, *The Demon-Haunted World: Science as a Candle in the Dark.* (New York: Random House, 1996), 29.

[3] For more about the 2013 National Forum on Ocean Exploration, see Aquarium of the Pacific and NOAA, "The Report of Ocean Exploration 2010," *National Forum on Ocean Exploration 2013*, accessed September 10, 2017, http://oceanexplorer.noaa.gov/oceanexploration2020/nationalframework.html.

Though great swaths of the population do not reside by the ocean, the manifestation of ocean-related environmental issues has been growing more experiential in terms of severe storms, drought, ice-melt, even higher prices for seafoood due to shrinking fish supplies. The problem is not the lack of visibility of these issues, but rather the public's ability to make the causal connection.

Never before have we had such broad access to scientific information about the sea, yet as the world's oceans slip into a state of crisis, the American public's grasp of the issues is far from firm. Esteemed marine scientist and aquanaut, Dr. Sylvia Earle claims we understand more about deep space than we do about the deep ocean. "We know more about what makes Mars function than about what makes the earth function," she states in an interview with Todd Reubold. "That's unacceptable. You can't take care of a place – or anything – if you don't understand it."[4] Perhaps it is no wonder, then, that Americans struggle with their relationship to the sea. A 2012 survey conducted by The Ocean Project indicates that public awareness of ocean issues in the United States has not advanced at all over a ten-year period.[5] There has been no progress despite consistent and continuing efforts by conservation, ocean, and other environmental organizations to inform and educate.

As a place so largely unknown, a universe that holds greater mysteries than truths, it could be argued that the history that we share with it is anything but deep. It has been

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[4] Sylvia Earle, interview by Todd Reubold, "Into the Wild Blue Under," *Momentum Magazine,* Fall, 2010, 22-23.

[5] The Ocean Project (TOP) is a scientific research collaborative that advances ocean conservation through strategic communications that provide opinion and market research, strategic insights, and support for public education and engagement programs. For a list of their communication reports see TOP's website: http://theoceanproject.org/reports/.

less than a century since humans first set eyes on the deep ocean, let alone study it. Whatever the reason for the disconnect, the need for better science communication served as a mantra throughout the weekend and the general consensus held that if the public cared about the issues, policy would follow. Galvanizing the public to care hinged upon spinning the science into story via the media.

But how do we begin to understand -- and relay that understanding -- of something as vast as the ocean, an area that covers more than two-thirds of our planet, when only five-percent of it has been explored? Communicating science to the general public means translating concepts that are often extremely complex and distant from common sense into a comprehensible language and creating interest in the public without betraying the depth of the science -- an enormously difficult task, if not almost impossible. Since ocean science is not located within the area of interest of most people, there exists a widely held notion that it must be approached in a way that appeals to the public's *other* interests. The goal of popularizing science is to reduce the distance between science and everyday knowledge -- a concept that is not new. Aristotle pointed out that while scientific discourse is valuable in a teaching situation, it is often not meaningful to a general audience. In that case, arguments must employ ordinary concepts, which the lay person can understand.

The culturally dominant view holds that the popularization of science rests on a two-stage model. First, scientists develop genuine knowledge, and second, popularizers

spread streamlined or "dumb-downed" versions to the public.[6] But this view, albeit widely-held, is far too simplified and leads to a false discourse. The outmoded "deficit model" of science communication was built upon an assumption of the division of knowledge between the experts (scientists) and non-experts (public). This theory purports that once the uneducated public was provided with adequate scientific information by the scientists, this deficit would be "fixed," knowledge would be transferred, and the public would understand and embrace the science.[7] No longer, however, is this deficit model of communication a viable approach as it characterized a top-down transmission of scientific information as an antidote to "public ignorance" and hence alienates key audiences who are in fact knowledgeable about the issue. Communication theorists, James Weber and Charlotte Word offer, "As scientists, we focus on accuracy, precision, and critical dialogue. This complex and technical approach to discussing data is poorly suited for sharing findings with nonscientists."[8] Some scientists distrust popularizers,

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[6] Stephen Hilgartner, "The Dominant View of Popularization: Conceptual Problems, Political Uses," in *Social Studies of Science* 20, no. 3 (Thousand Oaks, CA: Sage Publications, 1990): 519-539.

[7] For more on the "deficit model" of science communication, see Patrick Sturgis and Nick Allum, "Science in Society: Re-evaluating the Deficit Model of Public Attitudes," *Public Understanding of Science* 13, no. 1 (2004): 55-74; see also Tania Bubela, Matthew C. Nisbet, Rick Borchelt, Fern Brunger, Cristine Critchley, Edna Einsiedel, Gail Geller et al, "Science Communication Reconsidered." *Nature Biotechnology* 27, no. 6 (2009): 514-518; see also Massimiano Bucchi, "Of Deficits, Deviations and Dialogues: Theories of Public Communication of Science." *Handbook of Public Communication of Science and Technology* (2008): 57-76; see also Matthew C. Nisbet and Dietram A. Scheufele. "What's Next for Science Communication? Promising Directions and Lingering Distractions," *American Journal of Botany* 96, no. 10 (2009): 1767-1778.

[8] James Weber and Charlotte Wood, "The Communication Process as Evaluative Context: What Do Nonscientists Hear When Scientists Speak?" *Bioscience* 51 (June 2001):487–495, accessed June 14, 2017, https://doi.org/10.1641/0006-3568(2001)051[0487:TCPAEC]2.0.CO;2.

fearing they in fact skew the science by inserting their own goals, interests, and social or political agendas, which are sometimes at odds with those of the scientists themselves. They often find themselves locked in a blame game: scientists chide the media producers for getting the science wrong and/or "polluting" the science by distilling their scientific message to that of an artistic one, while media makers fault the scientists for being poor communicators.

Effective communication is not simply a one-way transmission of data, but rather a process that requires interpretation by the layperson (general public) in which *their own* opinions, personal beliefs and value sets are embedded. As Weber and Word caution, "Scientists do not stand above the process of negotiating meaning."[9] This is also problematic for a science filmmaker. How can we attempt to reconcile this when many scientists adhere to a communication style that is often devoid of emotion and advocacy while narrative structures employed in visual media completely depend on them in order to attract viewers' attention?

As the conversation in the room shifted to the role of film, television, and social media in disseminating the science, I was surprised by what I heard. While about half of the scientists in the room were perfectly content to let the "popularizers" convey their research to the public, many others had actually begun to take on science communication as part of their own role. "We simply have no choice but to tear down the walls between scientist and public," said Chris German, Senior Scientist for Deep Submergence at

[9] Ibid.

Woods Hole Oceanographic Institute.[10] He addressed the members of the forum with a potent message: "The days of keeping our research tucked away, to be seen only by a peer-review team are over. What practical good does that do for the ocean? These are critical times -- and desperate times call for desperate measures. That means we'd better start tweeting!"[11] At that, about a third of the group roared with laughter, a third cheered, and about a third fell silent.

The discussion that followed stressed the need for more ocean scientists to embrace visual and social media and to use it to directly engage the public in the scientific process -- to tell the stories about their science so that the public can understand not just what they do, but *why* they do it. The discussion then shifted to Jacques Cousteau and his ability to ignite public excitement for the marine world because he brought the experience of being in the ocean to the public. Through his films and TV programs, the audience gleaned unprecedented access into a previously unknown realm.

It occurred to me at that moment that I had been thinking of the popularization of science in too narrow of terms. As a scientist-turned-filmmaker myself, I brought my own biases into play, seizing on the false impression that scientists were incapable of reaching anyone beyond their own ivory tower, and that they needed filmmakers, celebrities, and social media experts to act as a conduit between them and the public. This is clearly an outmoded concept. Though there is no denying that many scientists share a

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[10] Chris German, "Ocean Exploration and Science Communication," Presentation at the *Ocean Exploration Forum 2020*, Aquarium of the Pacific, Long Beach, CA. July 20, 2013.
[11] Ibid.

proclivity for jargon, the digital age has enabled more and more of them to find other ways of communicating directly with the public.

It was an "Ah ha!" moment for me -- and in it I realized the answer to effective communication is embedded in the first rule of documentary filmmaking: know your audience. Science is not a passive process. The public shapes the science being done via epistemic values that guide the research itself. It is, in fact, a two-way interaction as the scientific pursuit is inherently value-laden, both as process and product, intrinsically tied to culture and societal norms. As the democratization of media becomes more widespread, more scientists are indeed getting to know their audiences, catapulting themselves from their ivory towers to connect with the public in direct ways.[12] In essence, they are *popularizing* in their own right, taking science to story via all media platforms and at times blurring the line between awareness and advocacy. That notion sparked in me a desire to explore the depth of America's relationship with the ocean and how it has evolved over time in concert with scientific pursuits and visual media.

As I set to work, drifting through the literature and considering my own experience, I found three specific mooring points to which I tethered my research: the history of ocean science, the popularization of that science, and the American experience itself. Each of these areas boasts brilliant scholarship on its own, yet for the most part have been kept to separate tents. I asked myself what I might discover if I drew them together and looked at them as a composite? I found the more I did so, the less I could

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[12] Peter C. List "Rachel Carson and George Wallace: Why Public Environmental Scientists Should be Advocates for Nature" in *Rachel Carson, Legacy and Challenge,* ed. Lisa H. Sideris and Kathleen Dean Moore, (New York: State University of New York Press, 2008); 41.

separate them. When allowed to mingle, a powerful alchemy results that creates a whole far greater than the sum of its parts; each of these disciplines feed and are nourished by each other.

Though I will build on scholarship in these arenas, I make no attempt to portray myself as an ocean scientist or a science historian, myself. My expertise is grounded in visual storytelling and it is through that lens that I feel equipped to provide a unique vantage. My hope is that by infusing the convergence of these themes into this work, it will serve to bolster the testament to the need for story to empower science and better invest the public. To that end, I have arranged this dissertation into four chapters.

Chapter One, "Mare Incognitum to Mare Nostrum," chronicles the narrative of the ocean from that of an unknown space to familiar home through an exploration of the sea and coastline through mythology, art, literature and the moving image, including my personal involvement with the making of the feature documentary, *Our Blue Canoe* (2016). Prior to the nineteenth century, and even through much of it, the ocean had been considered by Westerners (when considered at all) as *mare incognitum* -- an unknown and unknowable space -- and thus, an ahistorical zone. It was a mysterious realm where inexplicable things occurred, far outside human experience. It seemed what we didn't know about the ocean, in fact served to shape its identity.

Science and environmental historians have long grappled with how to apply scholarship of the ocean to their work, mainly because they have struggled mightily with its very definition: What *is* the ocean? Is it a resource to be explored and exploited? A

highway to connect lands? A conduit of imperialism? An island in and of itself?[13] To explore this question, I engage the scholarship of cultural and science historians such as John Mack, Gary Kroll, Alain Corbin, and Helen Rozwadowski who contend that early Western constructions of the sea paint it as an ahistorical domain, fraught with contradiction.[14] Through canonical works of literature and maritime art, to nineteenth-century ocean expeditions, to contemporary television shows and films, I analyze the roles that imagination, fear, culture, and curiosity have played in the narrative of the ocean and in shape-shifting the public's relationship with the sea and its shoreline. I then contrast these "ways of knowing" with those of whom share a deeply personal relationship with the sea. As I relay my experience working with native South Pacific islanders, I argue for the need to broaden the Western perspective to include Indigenous insights and voices if we are to have a complete understanding of our ocean.

Chapter Two, "'Pop' Goes the Ocean: Entertaining the Ocean's Place Through Beebe, Carson And Cousteau," maps a course from ignorance to scientific inquiry by investigating ocean science and exploration in the twentieth century as it was conveyed by three lions of Western popularization: William Beebe, Rachel Carson, and Jacques

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[13] See Philip E. Steinberg, *The Social Construction of the Ocean* (Cambridge: Cambridge University Press, 2001); Martin W. Lewis and Kären Wigen, *The Myth of Continents: A Critique of Metageography* (Berkeley: The University of California Press, 1997); Pierre Bélanger, *Landscape as Infrastructure: A Base Primer* (New York: Routledge, 2017).
[14] See Alain Corbin, *The Lure of the Sea: The Discovery of the Seaside 1750 - 1840*, (New York: Penguin Books, 1995); Gary Kroll, *America's Ocean Wilderness: A Cultural History of Twentieth Century Exploration* (Kansas: University Press of Kansas, 2008); John Mack, *The Sea: A Cultural History* (London: Reaktion Books, Ltd., 2011); Helen M. Rozwadowski, *Fathoming The Ocean: The Discovery and Exploration of the Deep Sea* (Cambridge, MA and London, UK: The Belknap Press of Harvard University Press, 2005).

Cousteau. In recounting their pursuits, I draw parallels and contrasts between their lives, work, and approaches to relaying marine science in an effort to punctuate the importance of visual storytelling to ignite interest and investment in science from the public.

This chapter also sets the stage for the rise of the concept of "oceancentrism" in which humans were viewed as insignificant participants in a drama dominated by the role of the ocean.[15] This notion, seeded by Beebe and expanded upon by Carson, grew into an environmental movement through the work of Cousteau that infused an anthropocentric logic. I use the evolution of their work as a means to deconstruct the idea of oceancentrism and contend that the twentieth century signaled a major shift in the public's investment in ocean issues as, for the first time, human impact became part of the narrative of the ocean. But to what end?

Chapter Three, "Redefining Narrative Ownership of the Ocean," appraises the current state of science communication and its fusion with the social sciences to effect change and influence policy. I discuss the precarious nature of claiming ownership over a story and posit the democratization of media has manifested as a double-edged sword that presents a complex problem in terms of the public's trust and understanding of ocean science. In order to examine this, I present the work of Dr. Sylvia Earle who argues for the need for exploration to better understand the health of the ocean. "We must explore to understand and protect the ocean as if our lives depend on it," she proclaims on camera in

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[15] Kroll, *America's Ocean Wilderness,* 97. See also Kroll, "Rachel Carson's the Sea Around Us, Ocean-Centrism and a Nascent Ocean Ethic" in *Rachel Carson, Legacy and Challenge,* ed. Lisa H. Sideris and Kathleen Dean Moore (New York: State University of New York Press, 2008), 118-35.

a World Ocean's Day announcement, "Because they do."[16] I set her argument against the philosophic questioning of exploration by science historian Gary Kroll who suggests that the ocean's plight can be linked to the way Westerners conceived of the sea as a frontier space destined to be explored, tamed and conquered.[17] He argues that latching onto the terrestrial logic that celebrated westward expansion of the late nineteenth and early twentieth-centuries has led to a "*Manifest Destiny* of the sea," shaping the way many Americans have related to it ever since – for better and for worse.[18] I build on the idea of a frontier mentality as it applies to the conceit of narrative ownership and contend that the democratization of western media has led to a "*Manifest Destiny* of science communication" so to speak, altering our relationship with the ocean as scientists, historians, and the American public at large. I will then assess the current state of science communication and its synthesis with the social sciences and argue that only when we dismantle the intellection of narrative ownership and shift to a collective narrative, will

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[16]Sylvia Earle, "World Ocean's Day," Global Goals for Sustainable Development, June 8, 2017, accessed June 15, 2017, https://www.facebook.com/globalgoalsUN/videos/vb.260097656025/ 10154885729306026/?type=2&theater.

[17] Kroll, "Introduction," *America's Ocean Wilderness,* 1-8. For additional scholarship on the frontier see Frederic Jackson Turner, "The Significance of the Frontier in American History," a paper read at the meeting of the American Historical Association in Chicago, July 12, 1893. It first appeared in the Proceedings of the State Historical Society of Wisconsin, December 14, 1893, 199–227; see also *Atlas of the New West: Portrait of a Changing Region,* William Riebsame, ed. (New York: W. W. Norton & Company, 1997); Carl Abbott, "Forum: Atlas of the New West." *Pacific Historical Review* 67, no. 3 (1998): 379-81; Ray Allen Billington and Martin Ridge, *Westward Expansion: A History of the American Frontier* (Albuquerque: University of New Mexico Press, 2001); Stephen Aron, "Lessons in Conquest: Towards a Greater Western History," *Pacific Historical Review* 64 (August 1996): 401- 429; Michael Steiner, "From Frontier to Region; FJT and the New Western History," Pacific Historical Review 64 (November 1995): 479-503.

[18] Gary Kroll, *America's Ocean Wilderness,* 2.

we be able to effect change and influence policy. I will cast a light on the work of scientists such as Charlie Veron and Dawn Wright and who are taking a trans-media approach to blurring the lines between marine scientist and ocean advocate in order to convey a scientific message that resonates with the public.

This chapter also draws on results of a survey I conducted for this project to gauge scientists' current use of visual and social media. The survey builds on the work of Dr. Daniel Kahan, a social scientist who spearheads the Cultural Cognition Project at Yale University and who has been exploring the cultural influence on people's views towards science topics.[19] Using Kahan's work to underpin the value of visual media and the necessity for public engagement in the narrative of the ocean as it relates specifically to ocean science, I lay the groundwork for the development of my non-profit organization, Ocean Media Institute which serves to create collective narrative of the ocean.

Chapter Four, "Crafting Deeper Stories: The Ocean Media Institute," introduces the reader to the motivation, programs and initiatives of the Ocean Media Institute. In my effort to draw together the worlds I have been a part of as a scientist, an educator and as a filmmaker, OMI is the culmination of my life's work thus far. This chapter provides an examination of the structure of the organization and its design as a global media

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[19] Daniel Kahan is the Elizabeth K. Dollard Professor of Law and Professor of Psychology at Yale Law School. The Cultural Cognition Project is an interdisciplinary team of scholars who use empirical methods to examine the impact of group values on perceptions of risk and related facts. For more, see: www.culturalcognition.net/kahan/; see also Daniel Kahan, "Fixing the Communications Failure," *Nature* 463, (January 21, 2010): 296-297; see also, Daniel Kahan, Hank Jenkins-Smith and Donald Braman, "Cultural Cognition of Scientific Consensus," *Journal of Risk Research* 14, no. 2 (2011): 147-174.

collective with a mission of expanding the public's understanding of ocean science through innovative visual media and artistic approaches to ocean literacy. Delving into our three-prong approach: to create, educate, and collaborate, I provide detailed examples of our work and its impact.

Diving Into an American Ocean: The Work My Work Will Do

As a scientist, filmmaker, writer, and educator, I was drawn to the field of American Studies because of its interdisciplinary approach to exploring the American Experience. During the early days of my research, I came across an article in *American Quarterly* that perfectly encapsulated my philosophy -- not only as a scholar, but as a practitioner of film, of education, of science. The article, "American Studies as Accompaniment" by Barbara Tomlinson and George Lipsitz appealed for scholars to "know the work we want our work to do."[20] I was immediately struck by this phrase and have carried it with me since. To know the work we want our work to do is essentially something I ask of myself and of my own students when they are trying to arrive at a concept for a film. Why do we make the films we do? What do we hope to achieve with the story we are telling? In my view, our role is not simply to do good work, but *create* good *with* our work. The more I considered this idea, the more I could see how it also applies to our work as scientists, as educators, as stewards.

Tomlinson and Lipsitz challenge us to frame our scholarly relations not as *competition,* but as *accompaniment.* As a documentary filmmaker, I am no stranger to

[20] Barbara Tomlinson and George Lipsitz, "American Studies as Accompaniment," *American Quarterly* 65, no. 1 (March 2013): 9.

the benefits (and the difficult task) of accompaniment. Filmmaking is a team sport. Within a crew, you may have a director with a vision, but that vision will be interpreted differently by the cinematographer, the writer, the sound recordist, the editor, and others. Each contribution offers something of value, and the culmination of that work creates something brand new that no one could have created individually. Those relationships and interactions translate to the actual film itself – pieces of the story are told through the words, the picture, the music, the sound effects, the pacing -- the way in which they are juxtaposed on screen creates the cohesive story. But it's not about the *addition* of voices and visions, it is about the *interplay* among them. "Accompaniment requires attention, communication, and cooperation," state Lipsitz and Tomlinson. "It means augmenting, accenting, or countering one musical voice with another."[21] In music, adding sounds doesn't create a richer aural experience; it just creates noise. It is the same with a film and with scholarly work.

In discussing the direction of American Studies, Lisa Duggan, former President of the American Studies Association attests that the strength of the field resides in the diverse and disparate voices that sometimes come together and sometimes clash, but always add to and expand our understanding of America.[22] American Studies has experienced a tumultuous history, but the transitions, revisions, and overhauls are by no means a sign of an enfeebled or shaky field. On the contrary, each shift reflects the vibrant pulse of a strengthening discipline, in synchronicity with the shifting social and

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[21] Ibid., 12.
[22] Lisa Duggan, interview by Sarah Mesle, "Fun, Fury and the American Studies Association" *Los Angeles Review of Books* (Nov. 6, 2014).

cultural tides. The story of American Studies is quintessentially the story of America itself -- ever growing, expanding, changing, redefining itself.

Over the course of the past few years I have given a great deal of thought to my place in this ever emerging and expanding field which is at once interdisciplinary, antidisciplinary, and transdisciplinary. Duggan's words brought to mind once again, George Lipsitz and Barbara Tominson's call to embrace accompaniment in our work -- to listen carefully and collaborate with those not only who share our ideas, but with those who may be coming from an entirely different -- and even competing -- perspective. This appears a simple concept, but to create true accompaniment poses a difficult task because it also requires paying attention to the silences and absences in the dialogue. It demands a broadened vision great enough to seek out and invite the voices that have been neglected, removed or absorbed by others. There is perhaps no greater "blind spot" in the American story than the overwhelming disregard of the Indigenous perspective. I argue that accompaniment without the addition of Indigenous knowledge is marginal; it creates an incomplete narrative.

In filmmaking, we frequently use the term "narrative ownership" to assert our signature on a story. It is always the storyteller (writer, director, producer) who claims the narrative that is constructed. For most of my career as a filmmaker, I embraced narrative ownership as a dictum of my field, but I have recently come to view it as limiting as it denies us the ability to achieve true accompaniment in our work and the ability to tell a complete story. I argue that in today's digital age it is time to disrupt the notion of narrative ownership and shift towards a collective narrative whereby we as

filmmakers relinquish our claim on the story and invite others to participate in a shared narrative. Doing so honors each voice of the storyteller, allows the story to expand, and makes it possible to relay lessons across societal lines.

We are also witnessing a collective shift in the approach to ocean science, itself. As the state of ocean health becomes ever more critical, researchers are beginning to resist the compartmental approach that has defined and divided the sciences for centuries and broadening their boundaries to engage those from other disciplines in their work. Elizabeth DeLoughrey, Humanities professor at UCLA with research focused on the Anthropocene, argues that we are witnessing an interdisciplinary transition that might be called "critical ocean studies" or "the oceanic turn."[23] Amplified by the interdisciplinary work of cultural anthropologists, this oceanic turn announces that we have indeed arrived at a new, blue world.

No longer does the ocean reside outside the human experience. Rising seas, life-threatening storms and dwindling fish stocks have repositioned this once "alien" space squarely within the periphery of scholars, media-makers, and the public alike. Harvard University's Urban Design professor, Pierre Bélanger argues the ocean is a contemporary urban space and subject of material, political, and ecologic significance and calls on us to reexamine the ocean's historic and superficial remoteness and to consider how we are

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[23] For discussion of the "oceanic turn," see Elizabeth DeLoughrey, "Ordinary Futures: Interspecies Worldings in the Anthropocene" in *Global Ecologies and the Environmental Humanities: Postcolonial Approaches,* eds. Elizabeth DeLoughrey, Jill Didur and Anthony Carrigan, (New York: Routledge Press, 2015), 354; see also Pierre Bélanger, "The Oceanic Turn: Advanced Landscape Infrastructure" Seminar, Harvard University, May, 2014; Stefan Helmreich, *Alien Ocean: Anthropological Voyages in Microbial Seas* (Los Angeles: University of California Press, 2009).

shaping it and how it is shaping us.[24] "Shaping" is the operative word here. As we currently have no national ocean literacy program and ocean science is usually only taught as a chapter within the earth sciences curriculum in public middle and high-schools, communicating the relevance of the ocean in our lives -- how it impacts us and how we impact it -- often falls on the shoulders of media-makers.

Recent years has boasted a surge in arts, film, literature, and scholarship concerned with our oceanic future and we have seen the story of the sea shift from that of utopian space of escape and renewal to a dystopian symbol of the future in terms of climate change. North American discourse about sea-level rise, acidification, and dead zones has become sensationalistic and apocalyptic in tone. Contemporary films such as *Oceans Rising* (2017) about an earth-destroying flood and books such as Brian Fagan's *The Attacking Ocean* (2014) paint the ocean as a malevolent entity and illuminate the catastrophic effects of a changing climate on a vulnerable modern society. These narratives continue to mark marine space as profoundly exceptional to human experience. "To characterize the ocean as catastrophic -- imperiled environment, coastal risk, or contested territory," writes Bélanger, "is to overlook its potential power."[25] In terms of popularization, drama sells. But fear wields a double-edged sword; though it can be a powerful motivator for change in some cases, it can also serve to disengage the public from working towards solutions. When issues are presented as insurmountable, it leads to a feeling of helplessness and resignation. It is therefore incumbent upon science

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[24] Pierre Bélanger, "The Other 71 Percent," *Wet Matter* (Harvard University: No. 39- F 2014): 7.
[25] Ibid.

communicators and popularizers of science to tread carefully when it comes to messaging.

Over the past three decades, science communicators have witnessed a fast growing and shifting movement in the field of Public Understanding of Science (PUS).[26] Established in 1985, with the initial goal of expanding the public's comprehension of scientific research, the field has since moved far beyond fostering mere awareness and into active engagement.[27] This is perhaps due to the fact that awareness itself doesn't move the needle, but engagement does. As with American Studies and the marine sciences, the field of PUS is also embracing a more holistic approach, one that infuses society with science. "We need to think about the reshaping of communicative relationships," writes Massimiano Bucchi, editor of the journal, *Public Understanding of Science*, "and, above all, to move away from conceptualizations of science and society as separate and distinct from each other."[28] In an ever-morphing media landscape, Bucchi advocates for science communicators to step outside their comfort zone and engage those external to the traditional mediators of newspapers and magazines and blogs. He argues

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[26] Public Awareness of Science (PAwS), Public Understanding of Science (PUS), or more recently, Public Engagement with Science and Technology (PEST) are terms relating to the attitudes, behaviors, opinions, and activities that comprise the relations between the general public or lay society as a whole to scientific knowledge and organization.

[27] For scholarship on the evolution of the PUS movement, see Martin Bauer, "The Evolution of Public Understanding of Science - Discourse and Comparative Evidence" *Science Technology and Society* 14, no. 2 (2009): 221-240; see also Jean-Baptiste Gouyon, "1985, Scientists Can't Do Science Alone, They Need Publics" *Public Understanding of Science* 25 no. 6 (May, 2016): 754-757; see also Stephen Shapin, "Science and the Public" *Companion to the History of Modern Science*. R.C. Olby et al., eds. (London and New York: Routledge, 1990), 990–1007.

[28] Massimiano Bucchi, "Editorial," *Public Understanding of Science* 25, no. 3 (London, UK: Sage Publishing, 2016): 264–268.

that as the boundaries of communication contexts become increasingly blurred, it should inspire researchers to explore "with more courage" the humanities, arts and culture -- areas that are largely neglected by science communication scholars, despite the growing art/science practice.[29] The role of innovative visual media in this convergence is not to be undersold. When science is visualized in a way that is artful, powerful and relatable to the public, it leads to a sense of investment. And when that investment is coupled with and achievable action, the public feels empowered to act and needles move.

Though the field of American Studies has been successful in its inclusion of voices in the domain of the humanities, it has yet to engage the sciences in a meaningful way. The journal *American Quarterly* brims with articles exploring issues of gender and race, of history and culture, of art and literature, yet when it comes to science, particularly ocean science, the journal is devoid of scholarship. As I will explore in this dissertation, the story of the ocean transcends art, culture, history, and science and draws from each in a way that provides a great opportunity for accompaniment. I argue that until we turn to the ocean in American Studies and begin to include it in our scholarship, we will remain deficient in fostering a meaningful dialogue and understanding of the world around us.

In a spirit of convergence and in order to draw together the fields of American Studies, Oceanography and the Popularization of Science, I have chosen to establish a non-profit organization called the Ocean Media Institute (OMI) as the accompanying project and enactment of this dissertation. OMI is designed to be a center for

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[29] Ibid.

collaborative work among scientists and media makers with a mission to enrich and expand the public's understanding of *and engagement in* ocean science through the collective creation, exhibition, and open-distribution of innovative visual media as well as artistic approaches to science communication. Through this organization, I am seeking to create a connective tissue that brings together not only a diverse array of voices, but a diverse array of attitudes toward the ocean in a way that has never before been attempted. At the core of OMI's mission is the truth that Ocean is everywhere.

People come to "value" the ocean for disparate reasons. Often, these stakeholders are kept in their separate camps and the media created with or about them and their views are not shared with those of opposing views. Creating collaborative opportunities for those who value the ocean for an array of reasons -- be it to discover new species, or discover new resources for extraction -- will serve to expand the dialogue and foster a better understanding of the issues, the science, the policies, and most importantly, a culture of stewardship. I am very much looking forward to the role this institute and my work will play in adding to the evolving story that is American Studies.

At the heart of this work is the confluence of science, technology, entrepreneurism, and advocacy. As we move through this digital age, visual media will increasingly be used by scientists not only as a tool for communication, but as a tool for catalyzing public investment in order to effect change and stimulate action that serves to protect our oceans.

CHAPTER ONE

MARE INCOGNITUM TO MARE NOSTRUM

To gaze into the depths of the sea is, in the imagination, like beholding the vast unknown, and from its most terrible point of view. . . There in the awful silence and darkness, the rude first forms of life, phantomlike, demoniacal, pursue their horrible instincts.
(Victor Hugo) [30]

The story of the ocean rolls through the western mind as fluidly as the sea itself. Mythology paints it as the playground of monsters and mermaids. It has assumed gender as either life-giving mother or strict, scolding father. Washington Irving referred to the ocean as a vast space of waters that separates the hemispheres like a blank page in existence.[31] Ralph Waldo Emerson puzzled as to why the first man who came to the sea didn't just turn around and go back.[32] Both a highway between continents and a barrier between lands, this liminal wilderness was a space to be traversed as quickly as possible in order to reach safe ground. We have feared, loved, loathed, and puzzled it for the qualities with which we have deemed it vested. But as much as we dance up to it, *defining* the ocean itself has proved to be an elusive pursuit, even to the most astute scientists, historians and scholars. How can we come to assign definition to the ocean as a place when embroiled in a fundamental debate as to whether it exists as a single ocean

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[30] Victor Hugo, *Toilers of the Sea*, ed. Ernest Rhys, trans. W. Moy Thomas, (London and Toronto: J. M. Dent, 1911), 292.
[31] Washington Irving, *The Voyage and Other English Essays from the Sketch Book,* (Boston: The Riverside Press, Houghton, Mifflin and Company, 1891), 5.
[32] See Alfred R. Ferguson, ed. "Sea 1833," *The Journals and Miscellaneous Notebooks of Ralph Waldo Emerson, Volume IV, 1832- 1834,* in which Emerson describes his return voyage from England to America, (Cambridge: The Belknap Press of Harvard University Press, 1964), 236-246; see also Kroll, *America's Ocean Wilderness,* 2.

or multiple?[33] Further, does applying meaning to the ocean essentially rely on its utility as a resource to be exploited or as a passageway between lands?

This chapter chronicles the ocean's shape-shifting narrative from that of a mysterious, unknown space to a meaningful, familiar home through its representation in mythology, art, literature, scientific illustration, and the moving image, including my work with South Pacific Islanders during production on the feature documentary, *Our Blue Canoe* (2016). I will introduce an ocean environment birthed of imagination and penned by the likes of Homer and Hugo, Daniel Defoe, Herman Melville, and Jules Verne. Engaging the work of cultural, historic and scientific scholars such as Alain Corbin, John Mack, Natascha Adamowski, George Cotkin, Gary Kroll, Helen Rozwadowski, and others, I will ply early western constructions of the sea, its science and its coastline and build on their scholarship to advance my testament to the power of visual storytelling. Through the works of seventeenth-century classic European maritime painters, to illustrations from nineteenth-century ocean expeditions, to visual mastery to contemporary television shows and films, I set out to analyze the roles that imagination, fear, culture, and curiosity play in crafting an image of the ocean and in shaping the

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[33] In their published principles of ocean literacy, the National Oceanographic and Atmospheric Administration (NOAA) argue for one singular global ocean, but five regional oceans. See NOAA, "How Many Oceans Are There?" https://oceanservice.noaa.gov/facts/howmanyoceans.html (accessed September 20, 2017); see also NOAA, "Ocean Literacy: The Essential Principles and Fundamental Concepts of Ocean Sciences for Learners of All Ages," Version 2: March 2013, http://oceanservice.noaa.gov/education/literacy/ocean_literacy.pdf (accessed June 5, 2017); for more on this debate, see also Robin K. Craig, "Taking the Long View of Ocean Ecosystems: Historical Science, Marien Restoration, and the Oceans Act of 2000," *Ecology Law Quarterly* 29, no. 4 (December, 2002): 649.

public's relationship with it. Using my work on *Our Blue Canoe* as a case study, I then build my argument for broadening the Western perspective to include Indigenous knowledge if we are to have a complete understanding of our ocean.

An Ocean Imagined

Until recently, the ocean had been considered by Westerners as *mare incognitum* -- an unknown and unknowable space that straddled both sides of a continent. Perceived as a void without community, the ocean lacked history -- at least not recorded history, as cultural historian John Mack suggests. "The sea, in these constructions of it, was empty: a space not a place," he writes in his book, *The Sea: A Cultural History.* "Literature and hymnology are replete with such reflection, rendering [it] a symbolic and metaphorical device rather than a real place."[34] It's perhaps no wonder, then, that the ocean has not figured strongly into the work of historians. Science historian Helen Rozwadowski attests that history is what gives spaces their meaning and therefore oceans require history to be understood. If something is beyond history, she argues, it is in fact beyond understanding.[35] Conversely, when we share a personal relationship with something, it falls away from the abstract and becomes real. In the case of the ocean, "space" becomes "place." But how do we come to understand an environment with which many of us had little direct experience and that had long been cast as a literal "void," seemingly empty of culture, art, political and social lore -- all which are facets of explorable history? For the

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[34] Mack, 16.
[35] Rozwadowski, *Fathoming The Ocean,* 4-5; for more on the ocean as an ahistorical domain, see also Kroll, "Introduction" in *America's Ocean Wilderness,* 1-7; Jonathan Raban *Coasting,* (London: Collins Harvill, 1986), 220.

ancient Greeks and Romans the sea was both geographically and temporally empty. In *The Edges of the Earth in Ancient Thought, Geography, Exploration, and Fiction*, cultural historian James Romm writes, "They imagined a sea to be closely associated with origins and endings, but without a history to call its own"[36] Amid this mysterious realm, where inexplicable things occurred far outside human experience, it seemed what we *didn't* know about the ocean served to *shape* its identity.

As a place physically inaccessible to humans without the use of specialized gear, the deep ocean remains unknowable as an immediate experience. Only with the aid of technology have we come to relate to it. "Epistemologically speaking, the realm of the sea lay beyond human reach and was accessible only through considerable technological effort," writes Natascha Adamowski, Professor for Media Cultural Studies at the Albert-Ludwigs-University in Freiburg, Germany. In her book, *The Mysterious Science of the Sea, 1775-1943,* Adamowski acknowledges the only way to experience the deep ocean is via artificial means such as aquariums or submersible. "Marine worlds have to be experienced in mediated form," she offers. "The relation between mankind and the sea is fundamentally based on technology that transforms it so that it may be grasped by human senses and understanding."[37] Taking Adamowski's argument a step further and fusing it with Rozwadowski's in considering the story of the ocean, I offer that it is not the technology alone that impacts understanding; it is the subjective transference of the experience -- the story-lens through which the message is conveyed to the public -- that

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[36] James Romm, *The Edges of the Earth in Ancient Thought, Geography, Exploration, and Fiction,* (Princeton, NJ: Princeton University Press, 1992), 23-26.
[37] Natascha Adamowski, *The Mysterious Science of the Sea, 1775-1943,* (London: Pickering & Chatto, 2015), 2.

shapes perception. As the color of that lens darkens or brightens with each telling, we conjure a reality of the ocean that serves to construct a history with it.

Though much has been written about the ocean as metaphor in works of art and literature, little attention has been paid to the role they have played in assigning an imagined history to those whom had little direct exposure to it.[38] The concept of the "unknown" invites the imagination to invent a world that is influenced by personal and social constructs, birthed from individual experience. Due to its inaccessibility, the mysterious world beneath the waves has always held immense power over the human psyche. What we can't witness for ourselves creates endless possibilities for what we choose to build and destroy within that void. The shape it takes depends on the architecture of our own mind.

Within the banks of the imagination, fear often fills the gaps between reality and fantasy. When it comes to the story of the ocean, exploiting that emotion makes for a potent plotline. The Bible describes in detail the formidable "Leviathan" as a giant sea serpent that knows no fear and is immune to all man's weapons: "Then I stood on the sand of the sea. And I saw a beast rising up out of the sea, having seven heads and ten horns, and on his horns ten crowns, and on his heads a blasphemous name."[39] The book of

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[38] See Philip E. Steinberg, "Of Other Seas: Metaphors and Materialities in Maritime Regions," *Atlantic Studies* 10, no. 2, (2013): 156-169, accessed September 12, 2017, http://www.tandfonline.com/doi/abs/10.1080/14788810.2013.785192; see also Dan Brayton, *Shakespeare's Ocean: An Ecocritical Exploration* (Charlottesville and London: University of Virginia Press, 2012); see also, Hans Bork, "Wind, Wave, and Generative Metaphor in Greek," Electronic Dissertation (Washington University, St. Louis, 2011), 463, accessed September 12, 2017, http://openscholarship.wustl.edu/etd/463.

[39] Rev. 13:1, New King James Version.

Isaiah also speaks of "Leviathan, the squirming serpent; . . . the sea monster,"[40] and in the book of Job, God's description of the leviathan concludes with, "Nothing on earth is its equal—a creature without fear."[41] Both ancient and contemporary Euro-American literature brims with wars waged against fantastical creatures of the deep. From Odysseus' contest with the monstrous Scylla and Charybdis in Homer's epic 8th century BC poem, the *Odyssey*, to Captain Ahab's battle with his cetaceous arch-nemesis in Herman Melville's 1851 literary opus*, Moby-Dick,* to Peter Benchley's 1974 contemporary classic, *Jaws,* in which an insatiable great white shark terrorizes an entire coastal community, the sea has birthed villains that only men of highest virtue can assail. The commoner has historically suffered the wrath of ocean dwellers, as captured in these lines from Homer, describing Scylla's torment of the sailors who ventured too close to her shore:

> . . .they writhed, gasping as Scylla swung them up her cliff
> and there at her cavern's mouth she bolted them down raw—
> screaming out, flinging their arms toward me,
> lost in that mortal struggle.[42]

We don't know much about Homer, but one thing on which most scholars agree is that he was not a man of the sea. But it was precisely his lack of first-hand education that lent originative vision to his work. "Had [Homer] been more familiar with the offshore world," writes John Gillis in *Islands of the Mind,* "we may have never had this world of genius, for it was the unknown sea and its equally unknown islands that give latitude to

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[40] Is. 27:1.
[41] Job 41:33.
[42] Homer, *The Odyssey,* translated by Robert Fagles (New York: Penguin Classics, 1996), 279.

Homer's unsurpassed imagination."[43] Through his words, he invented a terrifying world that invited and inspired creative visual representation both in ancient times through depictions of Homeric scenes on vases, wine jugs and wall paintings, as well as in contemporary art that is being created today (see figures 1, 2).



Figure 1. *Scylla as a maiden with a kētos tail and dog heads sprouting from her body.* Red figure bell-crater in the Louvre, 450–425 BCE. *Source:* Badibulgue: Blog du college Charcot de Cherbourg. Accessed May 14, 2017.http://badibulgue.free.fr/?p=2566.[44]

[43] John Gillis, *Islands of the Mind: How the Human Imagination Created the Atlantic World.* (New York: Palgrave MacMillan, 2004), *5.*

[44] This form of Scylla was prevalent in ancient depictions, though very different from the description by Homer, where she is more dragon-like. See Daniel Ogden, *Drakon Myth and Serpent Cult in the Greek and Roman Worlds,* (New York: Oxford University Press, 2013), 132.



Figure 2. *Odysseus and Scylla,* Annie Stegg, 2012. *Source:* Deviant Art. Accessed Oct 4, 2017. https://pinkparasol.deviantart.com/art/Odysseus-and-Scylla-327221936

One would think the passage of two-thousand years may provide enough time to come to know a place and its inhabitants, but by the nineteenth century, westerners' familiarity with the ocean had in fact expanded little. In 1859, Victor Hugo (1802-1885) was living in exile in the Channel Islands. On a trip to Sark, this student of the natural world himself caught his first glimpse of an octopus, which the locals called "devilfish" and "bloodsucker." These colorful aliases paired with his conviction that one of these creatures pursued his son while swimming off Sark, perhaps motivated his creation of the soulless man-killer of *Toilers of the Sea* (1866):

> It is difficult for those who have not seen it to believe in the existence of the devilfish . . . At times we are tempted to imagine that the vague forms which float in our dreams may encounter in the realm of the Possible attractive forces, having power to fix their lineaments, and shape living beings, out of these creatures of our slumbers. The Unknown has power over these strange visions, and out of them composes monsters. Orpheus, Homer, and Hesiod

> imagined only the Chimera: Providence has created this terrible creature of the sea. Creation abounds in monstrous forms of life.[45]

The ocean of Western imagination, steeped in fear and fueled by stories of bloodthirsty beasts, perpetuated a foreboding image of the ocean that extended to its coastline, serving to further complicate our understanding of it. In *The Sea: A Cultural History*, Mack writes, "Oceans do not function to promote uniformity. They are rather arenas of transitional interchange."[46] This ever-shifting conception of a sea-scape transferred to an ever-shifting relationship between Westerners and the sea, one that begins at its shore.

The Coastline of Collective Conscience

Roll on, thou deep and dark and blue ocean, roll!
Then thousand fleets sweep over thee in vain;
Man marks the earth with ruin, -- his control
Stops with the shore. (Lord Byron)[47]

What better place to wade into a discussion of the western relationship with the sea than at its shore, that physical and metaphorical liminal space that both connects and divides habitable and uninhabitable worlds; that in-between place of what is knowable and what is not. The very process of shifting tides held the shoreline as an ambiguous place, not fully of the terrestrial nor of the oceanic. It is little wonder, then, it made for a

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[45] Victor Hugo, *Toilers of the Sea*, ed. Ernest Rhys, trans. W. Moy Thomas, (London and Toronto: J. M. Dent, 1911), 290.
[46] Mack, 20.
[47] George Gordon Byron, "Lord Byron Quotes," BrainyQuote.com, accessed May 9, 2017, https://www.brainyquote.com/quotes/quotes/l/lordbyron165335.html.

transgressive boundary in art, literature and film.

Throughout history, the beach has been cast just as much as a landing place as it is a launch point. The ancient shores of classical literature and mythology are littered with tales of woe. Alain Corbin writes in *The Lure of the Sea*, "The shore of antiquity was also the receptacle of the sea's rejections; it is along the beach that the ocean purges itself and throws up its monsters." [48] As a perennial haunt of shipwrecks, savages, cannibals, and castaways, those who end up there were neither invited nor welcomed. If the story of sea was relayed in terms of an unknowable and fearsome place, the shoreline compounded that notion, for it offered up "physical evidence" of the ocean's malevolence by way of wreckage strewn upon its beaches and uncivilized behavior that played out on its sands.

At the dawn of the eighteenth century, Daniel Defoe penned *Robinson Crusoe* (1719) as the forefather to all castaway stories, pregnant with the ills of life on the shore. Drawing on tales of the previous two centuries of seafaring, it expanded on the perils that rose from the sea and its shores. In the novel, Crusoe rarely ventures onto the beach himself as it is holds shredded reminders of the disastrous event that put him there: his ship, shattered against the reefs, mangled beyond repair. It is also the site of all that is to him, unholy. At the water's edge, cannibals engage in their orgies and "savages" dance in their nakedness. Yet, the beach also held the only possibility for salvage. "If beaches and coasts are places of transaction, of negotiation between the realms of sea and land,"

[48] Corbin, 13.

writes John Mack, "there needs to be some means of reconciliation between them."[49] To that reconciliatory effect, Crusoe succeeded as he maneuvered between roles of sailor, farmer, and beach-comber, maintaining domesticity over the island while keeping vigilant watch on the horizon in hope of rescue. For the reader, the beach manifests in their mind's eye as both origin and terminus of jeopardy.

The beach as a testing ground is pervasive in contemporary American popular culture, especially in terms of visual media. From the comedic television series, *Gilligan's Island* (1964-1967), the story of seven castaways whose unsuccessful attempts at rescue keep them island-bound for three television seasons; to the feature film, *Cast Away* (2000), about a lone FedEx employee's struggle for survival on an uninhabited island after his plane crashes into the Pacific; to long-running reality television series, *Survivor* (2000-present), in which a group of strangers marooned on a remote island must compete to resist elimination; to the primetime TV dramatic series, *Lost* (2004-2010) whereby survivors of a commercial airline crash on a tropical island, "somewhere in the Pacific" are menaced by a supernatural being, the American public's appetite for the Crusonian appears to be far from sated.

Between the mid-eighteenth and mid-nineteenth centuries, the shoreline took on new meaning and expanded in Anglo-American consciousness from a place that represented nature's malevolence to that which excited and allured aristocrats. This shift towards an appreciation of the shore was no accident, due predominantly to the Dutch as a well-crafted publicity stunt of sorts. During this time, European maritime culture

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[49] Mack,168.

crested to its peak and artwork depicting the ocean in its roiling grandeur began flooding galleries and public spaces, reinforcing the notion of the ocean as a place of sublime, awe-inspiring power.

Holland had emerged as a nation closely identified with the sea, assigning their mercantile success to their armadas' unparalleled ability to tame the fury of the ocean, albeit by the grace of God. As Corbin states, "The Miraculous affluence of the shores reinforced the image of Holland as a country blessed by God."[50] This depiction of Holland was exploited for political gain through a movement by the oligarchy to produce art that celebrated the ocean in order to create a national culture. "The Dutch seascape as a pictorial genre is the outcome of a drive to glorify the energy of a social class," writes Corbin. [51] It worked -- in terms of both glorifying that energy and harnessing it. The coast became a magnet for aristocratic tourists, poets and artists of the Classical Age eager to own -- and sell -- a piece of this sea for themselves.

The aesthetics of the Sublime permeated Dutch art, drawing the French and Englishmen away from the cities to witness the awe-inspiring power of the ocean for themselves. In 1773, French philosopher and art critic Denis Diderot wrote in *Voyage en Hollande,* "The sight of the ocean on the same level as the earth will make you wonder and shudder."[52] The appeal of the beach was bound in the paradox that the shore offered refuge because it inspired fear. "This was where the sublime beauty of the ocean and pathos of its storms unfolded," Corbin attests. "Here, more than anywhere else, the

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[50] Corbin, 33.
[51] Ibid.
[52] Denis Diderot, *Voyage en Hollande,* 337; See also Corbin, 34.

individual found means of encountering the elements and enjoying the brightness or transparency of the water."[53] To stand on the shore, gazing upon a churning sea as the wind whipped your hair and salt sprayed your skin, was at once both experiential and voyeuristic. From that vantage, one was humbled, yet empowered by the ability to remain safe and in control while witnessing the thrill of being in the presence of something far more magnificent, the indomitable ocean. As I will explore in the next chapter, this experiential effect is one that Cousteau would reincarnate for motion picture audiences two centuries later and that filmmakers are to this day still striving to replicate.

The decades between 1750 - 1840 revealed an irresistible awakening of a collective desire for the shore. With the expansion of the railroad throughout Europe and America, the coastline became more accessible to the working classes, and by the mid-nineteenth century, the modern public beach came into existence and from it a new community was birthed. No longer belonging solely to the upper class, the coast emerged as a social space for all. Some came to enjoy its natural beauty, others to spend an afternoon with friends and family, and others to cultivate ideas that ran far deeper.

From this periphery, some glanced out over the waves and not only wondered about the world beyond, but packed their bags. Over the course of the following decades, ocean travel brought thousands of people in direct contact with the open ocean for the very first time in history. They were people who wrote about it, created art from it, and dialogued about the pleasures and perils of its raw nature -- all of which served to add to build our history with the ocean.

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[53] Corbin, 53.

Shifting Tides in Art, Literature and Science

Prior to the nineteenth century, travel across the open ocean was reserved for the hearty few who had reason to go -- whether to work, emigrate, or perhaps fight distant battles. Going to sea was not only dangerous, but as Rozwadoski puts it, "It involved an uncomfortably long encounter with an international maritime culture of life at sea that polite society preferred to ignore."[54] For those who hadn't experienced it for themselves, the tortures of life on the high seas was conveyed to the public in grim detail through works of art. Although the sea is represented in ancient artwork from Greek vases to Egyptian tomb paintings, the first Western images were painted by European mariners.[55] Though there are thousands of works of maritime art that represent the ocean in myriad ways, I have chosen to highlight a handful that reinforce the notion of the Sublime as it was a visual theme returned to time and again from the seventeenth century on, and thus significant in shaping Westerners' complicated relationship with the ocean.

In the previous section, I introduced the immense contribution by the Dutch in terms of maritime art. Seventeenth century Dutch painters, Aelbert Cuyp, Jan van Goyen, and Willem van de Velde were among the most prominent marine painters of their time, credited for developing marine art as its own genre. Perhaps lesser known was

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[54] Rozwadowski, *Fathoming the Ocean,* 9.

[55] Discussions of marine art have mainly been restricted to discussion of pictorial representations and inevitably have not included indigenous cultures around the world. For more, see Denis E. Cosgrove, *Social Formation and Symbolic Landscape,* (London: Croom Helm, 1984); Rozwadowski, *Fathoming the Ocean,* 9; Mack, *The Sea: A Cultural History,* 31. Bernhard, Klein and Gesa Mackenthun, eds. *Sea-Changes: Historicizing the Ocean,* (New York: Routledge, 2004).

the work of Ludolph Backhuysen, who had a penchant for theatrically capturing the forces of nature in his paintings. His highly dramatic piece, *Dutch Ships in Distress off a Rocky Coast* (figure 3) depicted Dutch ships facing imminent disaster of being swallowed by a raging sea as they headed for collision with each other or with the murderous rocks just ahead. On its surface, it is the story of ships appearing to have lost control under the command of omnipotent nature. For the audience of the time who viewed it through the eyes of a Calvanist Dutchman, however, it represented human vulnerability at the will of an almighty God.



Figure 3. *Dutch Ships in Distress off a Rocky Coast*, Ludolph Backhuysen, 1667. *Source:* Sailing Warship.com. Accessed September 20, 2017. http://www.sailingwarship.com/wp-content/uploads/2010/04/Dutch-Ships-in-Distress-off-a-Rocky-Coast-Backhuysen-Ludoph.jpg.

By the nineteenth century, American and English painters such as Winslow Homer and J. M. W. (Joseph) Turner were also depicting the "character" of the ocean in

terms of the Sublime, from the god that blesses to the demon that destroys -- and the devil was in the details. The boundless seascape was rarely portrayed in pictures. The artists usually drew from their own direct experience of the coast or being on the sea to focus on specific events which emerged in their various depictions.[56] Details of the seafarers' excursions were often greatly embellished. Turner, in fact, often set out to make "improvements" on the works of the Dutch Masters, playing on the themes of familiar marine paintings, yet significantly dramatizing them.

Turner's *Fishermen at Sea* (figure 4), currently held in the Tate art museum in London, features a nocturnal scene of fishing boats in peril under a hard, cold moon. The only sign of humanity comes from the small flicker of firelight from the fishermen's lantern. Here, Turner chose to depict the nature of the ocean in which "the power of God" shone through, once again, reflecting the Sublime. According to art historians, this particular work summarizes all that had been said about the sea by the artists of the eighteenth century.[57] In its awe-inspiring, savage grandeur, the ocean at that time represented a wilderness untamed, and untamable, by man. Though mere exercises in imagination, these paintings spoke to the fragility of life in the Anglo-American psyche

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[56] Mack, 31; see also Karen Rosenberg, "That Visionary Wharf Rat, J.M.W. Turner," *New York Times,* March 16, 2017, https://www.nytimes.com/2017/03/16/arts/that visionary-wharf-rat-jmw-turner.html?_r=0; see also "Who Is JMW Turner?" Khan Academy online, https://www.khanacademy.org/humanities/becoming modern/romanticism/england-constable-turner/a/who-is-jmw-turner

[57] See Martin Butlin and Evelyn Joll. *The Paintings of J.M.W. Turner*, New Haven: Yale University Press, (1984); Andrew Wilton, *Turner In His Time,* (London: Thames & Hudson, 2006), 27; Richard Johns, "JMW Turner: Master of the Ocean," The Guardian, November 15, 2013, accessed June 3, 2017, https://www.theguardian.com/artanddesign/2013/nov/15/jmw-turner-sea-paintings-national-maritime.

by visualizing nature's -- and specifically the ocean's -- power over humankind. No matter how physically close we could get to the ocean, it would always remain separate and thus unknowable.



Figure 4. *Fishermen at Sea.* J. M. W. Turner, 1796. *Source:* Tate Museum Online, accessed May 14, 2017. http://www.tate.org.uk/art/artworks/turner-fishermen-at-sea-t01585.

American painter, Winslow Homer (1836–1910) made a valiant effort to know the ocean. Dubbed a Yankee Robinson Crusoe, "cloistered on his art island," Homer lived much of his life by the sea, whether in his native New England, Florida, the Caribbean, or the coastal villages of England. He painted what he knew, transferring his own psychological tussles to the canvas through potent works that were embraced by the public because they spoke to universal struggles.[58] *The Gulf Stream* (Figure 5), for

[58] Nicolai Cikovsky Jr., *Winslow Homer: The American Collections, Columbus Museum of Art,* (New York: Harry N. Abrams, 1988), 2; see also "Winslow Homer: The Complete Works," accessed October 11, 2017, https://www.winslow-homer.com; see also "Winslow Homer: American Artist," a video featuring correspondent Rita Braver as she

example, depicts a lone man on a rudderless fishing boat with its mast broken, being tossed on the waves while hungry sharks patrol nearby and a waterspout looms in the distance. The sense of our collective mortality in the midst of a fearsome environment is palpable. In English, the phrase "all at sea" carries with it the sense that someone is completely and utterly lost. Homer's sea was that of wilderness, a place without paths to lead one home. Once in its midst, the fear of becoming irretrievably disoriented is inescapable.[59]



Figure 5. *The Gulf Stream.* Winslow Homer, 1899.
Source: Official Winslow Homer website. Accessed May 15, 2017. https://www.winslow-homer.com/The-Gulf-Stream.html.

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explores the studio where Homer spent the last quarter century of his life on the coast in Prout's Neck, Maine, accessed October 11, 2017, https://www.youtube.com/watch?v=61mGVv2sbbk.

[59]Mack, 72; See also Charles Colbert, "Winslow Homer, Reluctant Modern," *Winterthur Portfolio* 38, no. 1 (Spring 2003): 37-55; see also Philip C. Beam, and Louis Homer Graham. *Winslow Homer in the 1890s: Prout's Neck Observed,* (New York: Hudson Hills Press, 1990), 66-85.

Juxtaposing the fragility of human life with the raw power of nature speaks to the collective Christian mindset of the time. The canvas became a grand stage for religious theater and upon it the ocean served as the quintessential setting for human dramas to play out because it well-represented the volatile force of nature, or the formidable will of God. One in the same, the sea and God were both forces to be reckoned with, both unpredictable constructions of power under which the weak, the prideful, or the sinful, would be crushed. In that sense the ocean, as with God, was unfathomable. One could explore the sea, but one could never control it and thus, never truly know it. Activities such as whaling, fishing or sampling could at best provide indirect knowledge of the ocean. The puzzle called the deep, boasting creatures just as mysterious and formidable as their surroundings, offered a seductive pairing: scientific intrigue in this strange world and the quest to harpoon the human condition.

In the mid-nineteenth century, one iconic creature burst from the depths of a young American writer's imagination to land on the pages of what has been noted as "the greatest book of the sea ever written."[60] Drawing on his own experience at sea and coupling it with the literary inspirations of those such as Shakespeare, Homer, and Byron, a novelist named Herman Melville (1819 - 1891) scribed the words that became three of the most famous in American literature: "Call me Ishmael."[61] A year-and-a-half after beginning his novel about the great white whale, Melville capped his pen and *Moby-Dick* was published as *The Whale* in London in 1851. Unfortunately for Melville, the book was

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[60] D.H. Lawrence, 1923.
[61] Herman Melville, *Moby-Dick: A Longman Critical Edition*, John Bryant and Haskell Singer, eds. (New York: Longman, 2007), 3.

deemed a commercial failure at the time of publication and throughout his life, as this 200,000-word literary leviathan was pregnant with language too obscure and baroque for its audience to bear. One example is this paragraph-long, one-sentence simile describing how the thirty-man crew banded together as a single unit:

> For as the one ship that held them all; though it was put together of all contrasting things—oak, and maple, and pine wood; iron, and pitch, and hemp—yet all these ran into each other in the one concrete hull, which shot on its way, both balanced and directed by the long central keel; even so, all the individualities of the crew, this man's valor, that man's fear; guilt and guiltiness, all varieties were welded into oneness, and were all directed to that fatal goal which Ahab their one lord and keel did point to.[62]

Weaving together nautical, biblical, literary and cetological influences, Melville's style is nothing short of "alliterative, fanciful, colloquial, archaic, and unceasingly allusive," according to John Bryant and Haskell, the editors of *Moby-Dick: A Longman Critical Edition*.[63] Rife with metaphor, allusion, and a style that swings wildly from colloquial prose to high rhetoric, every page of the novel tests and exhausts the possibilities of grammar.

Remarkable, however, is Melville's integration of -- and underlying commentary on -- science, to which he points the occasional barb.[64] His lavish attention to cetological documentation reveals itself in no less than seventeen of the novel's 135 chapters that focus on whale anatomy, physiology or behavior. Chapters such as "The Sperm

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[62] Ibid., Chapter 134: "The Chase – Second Day," 546.
[63] Ibid., xv.
[64] For more on the influence of science on Moby Dick, see Philip Hoare, "Cetology: How Science Inspired Moby Dick," *Nature* 493 (January 2013): 160-162; see also George Cotkin, *Dive Deeper: Journeys with Moby-Dick,* Oxford, UK: Oxford University Press, 2012.

Whale's Head — Contrasted View" lay out in encyclopedic detail the whale's anatomical structure, while blending the factual information with sardonic analogy:

> Far back on the side of the head, and low down, near the angle of the either whale's jaw, if you narrowly search, you will at last see a lashless eye, which you would fancy to be a young colt's eye; so out of all proportion is it to the magnitude of the head. Now from this peculiar sideway position of the whale's eyes, it is plain that he can never see an object which is exactly ahead, no more than he can one exactly astern. In a word, the position of the whale's eyes corresponds to that of a man's ears; and you may fancy, for yourself, how it would fare with you, did you sideways survey objects through your ears . . . If your bitterest foe were walking straight towards you, with dagger uplifted in broad day, you would not be able to see him, any more than if he were stealing upon you from behind. In a word, you would have two backs, so to speak; but at the same time, also, two fronts (side fronts): for what is it that makes the front of a man -- what, indeed, but his eyes?[65]

Passages that read like biology lectures flood the chapters; one can imagine Melville dressed in a lab coat standing beside a preserved whale as he relays his irreverent lessons. But it is perhaps Melville's penchant for poking fun at the idea of scientific certainty that is most notable. Though whales were scientifically classified as mammals by this time, the general public was loathe to accept them as anything but fishes. This highly contested question is one that Melville's narrator Ishmael devotes a great deal of time to, and in the scientifically-saturated chapter titled "Cetology," he emphatically, albeit incorrectly, declares his conclusion:

> "Be it known, then, waiving all argument, I take the good old fashioned ground that the whale is a fish, and call upon holy Jonah to back me. . .
>
> Next, how shall we define the whale, by his obvious externals, so as conspicuously to label him for all time to come? To be short then, a whale is *a spouting fish with a horizontal tail.* There you have him."[66]

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[65] Ibid. Chapter 74: "The Sperm Whale's Head -- Contrasted View," 212.
[66] Ibid., Chapter 32: "Cetology," 91.

As Melville further attempts to categorize each species of whale into books called *folios,* he plays on the scientific classification of cetacean species at the time, drawing from Thomas Beale's seminal book on whale behavior and anatomy, *The Natural History of the Sperm Whale* (1839). Beale was the first to write scientifically about this particular animal, spinning his experiences aboard a British whaling ship, where he worked as a surgeon, into observations of the whale's behavior and anatomy.

Melville also gleaned inspiration from the English scientist and explorer, William Scoresby and his groundbreaking book, *An Account of the Arctic Regions* (1820). This book offered Melville insight into the Bowhead whale, known then as the common whale, whose population was decimated due to whaling. Riffing on Scoresby's observations of an ancient Inuit harpoon embedded in a bowhead's blubber, Ishmael poses, “Who had darted that stone lance? And when? It might have been darted by some Nor' West Indian long before America was discovered."[67] Melville may not have been far off in his assessment of the whale's age. Scientists agree that bowheads are the longest-living mammal on earth, with lifespans of over 200 years.[68]

Though Melville was scientifically astute himself, his references to past and contemporary research prod at the idea of "infallible science." In once case, he makes a jab at the French natural historian, Bernard Germaine de Lacépède who erroneously named eight species of this whale when there are in fact only three. [69] In the Cetology

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[67] Ibid, "Chapter 81: The Pequod Meets the Virgin," 348.
[68] See "What is the Longest Lived Marine Mammal?" National Oceanic and Atmospheric Administration's Ocean Facts, accessed November 21, 2017, https://oceanservice.noaa.gov/facts/bowhead.html.
[69] Hoare, "Cetology."

chapter, Melville declares previous attempts to classify whales as “all wrong” and introduces two authorities to bolster his claim: those none other than Beale and Scoresby.

> It is some systematized exhibition of the whale in his broad genera, that I would now fain put before you. Yet is its no easy task. The classification of the constituents of a chaos, nothing less is here essayed. Listen to what the best and latest authorities have laid down.
>
> 'No branch of Zoology is so much involved as that which is entitled Cetology,' says Captain Scoresby, A.D. 1820.
>
> 'It is not my intention, were it in my power to enter into the inquiry as to the true method of dividing the cetacea into groups and families...Utter confusion exists among the historians of this animal' (sperm whale), says Surgeon Beale, A.D. 1839.[70]

At this time in western history, science began to undergo a sea change as the gentleman scientists of the century's start gave way to more specialized and professionalized successors.[71] One scientific figure of this time loomed large: Charles Darwin. Though Melville was not schooled deeply in evolutionary science, there is no question that *Moby-Dick* was prescient of the scientific cataclysm that was yet to come. Darwin's *On the Origin of Species* made its debut in 1859, eight years after Moby-Dick was published. "A primary subtext of Melville's novel is the passing of pre-Darwinian, anthropocentric thought, espoused by Ahab and the inauguration of a version of Darwin's more ecological evolution, proffered by Ishmael," writes Dr. Eric Wilson, Professor of English at Wake Forest University.[72] The deep philosophical differences between Ahab and Ishmael reflect opposing attitudes of the human

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[70] Melville, Chapter 32: "Cetology," 91.
[71] Hoare, "Cetology."
[72] Eric Wilson, "Melville, Darwin, and the Great Chain of Being," *Studies in American Fiction* 28, no. 2 (Autumn 2000): 131-150.

relationship with nature. Ahab's active pursuit of the whale represents an ideology of man's supremacy over the natural world, while Ishmael identifies as a bystander, signifying man as an unimportant player in the workings of nature. Ahab's demise signals the end of pre-Darwinian thought that humans are fundamentally in control of nature and superior to all wild things, whereby Ishmael's rise illustrates the alternative -- a world far more complex and controlled by the forces of nature.

Melville never saw *Moby-Dick* reach commercial success, as it did not gain literary appreciation until the twentieth century. Yet, that did nothing to diminish its value of this transcendent work. "The novel makes us aware of the power of scientific explanation (the cetology sections), without reducing all of life to certitude," writes George Cotkin, author of *Dive Deeper, Journeys with Moby-Dick.* "There is something lurking at the edges of knowledge. Here, science must be joined by the 'illuminated eye of imagination and dream.'"[73] Written at a time when art and science were fluid enough to slip into each other's tents, this "laboratory of literature"[74] stands more than a century-and-a-half later as a critical bridge between cultural history and natural history, science and sensibility. Embedded in the story of the mystery and might of a great white whale, lay the foundation for pivotal discourse about scientific ethos and human's complicated relationship with nature. Though Melville perhaps didn't know it at the time, he had created a space for accompaniment.

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[73] Cotkin, 154.
[74] Hoare, referring to *Moby-Dick* in "Cetology."

High Seas, Deep Science

The maritime culture of the high seas, in full swing at the mid-nineteenth century, crafted a narrative of exploration that translated to deeper scientific inquiry. This "unknown space" between continents began to draw serious scientific attention as the nineteenth century progressed.[75] Naval scientists from various countries began investigating various aspects of the ocean, such as seawater chemistry and marine invertebrates, but Britain and the United States led the charge to make scientific study of the ocean a priority -- a move spurred by attempts to lay a transatlantic submarine telegraph cable in the 1850s and 60s to link the two continents. The brain behind the project was U.S. Naval Officer and engineer, Matthew Fontaine Maury. His extensive research included efforts to chart the Atlantic Ocean floor, the first comprehensive oceanographic study ever made. His 1855 publication, *The Physical Geography of the Sea,* is considered the first modern textbook of oceanography and earned him the reputation as the "Founding Father of Oceanography." The book itself, written in lyrical prose and published to a wide audience served to introduce the public to the deep ocean and helped them to visualize it in a way they could not have previously. One excerpt describing the sea floor reads:

> Could the waters of the Atlantic be drawn off... it would present a scene the most rugged, grand, and imposing. The very ribs of the solid earth,

[75] See Michael S. Reidy and Helen M Rozwadowski, "Focus: Knowing the Ocean: A Role for the History of Science; The Spaces In Between: Science, Ocean, Empire," *Isis,* 105 no. 2 (2014): 338-351; Rozwadowski, *Fathoming the Ocean*, 4.

> with the foundations of the sea, would be brought to light, and we should have presented to us at one view the empty cradle of the ocean . . .[76]

Running a cable three miles deep and for 2,000 miles along this "cradle of the ocean" seemed an impossible endeavor -- and it nearly was. Failed attempts plagued the project for a decade, but success came in 1866. Deep-sea surveys conducted by the American and British navies at this time represented some of the first attempts to sound the deep ocean. This resulted in new knowledge about the sea floor, but more importantly, it illustrated how much more there was to learn. What began as a desire to understand the deep ocean built into the necessity for further investigation.

In the end, the transatlantic cable project led to the classification of multitudes of new species that were translated into illustrations for an amazed and engaged public. Perhaps more importantly, it spun the science into a good story; one that contained a bold mission, the drama of near failure, surprise, and revelation. This event among others would serve to popularize ocean science on a global level as never before.[77] A proliferation of oceanic adventure stories and images of the sea in mid-nineteenth century America reflected a deepening acquaintance with the ocean. From clothing to collectables, to restaurant menus, the sea began to settle in to its new position in popular culture. The scientific discoveries of the day spurred the ingenuity of creative writers beyond Melville who invented new worlds based on the findings and attracted new audiences to the wonder of the sea. But it was Maury's *Physical Geography of the Sea*

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[76] Matthew Fontaine Maury, *The Physical Geography of the Sea* (New York: Harper and Brothers, 1855), 315. See also Smithsonian Libraries Online, "Sea Change," https://library.si.edu/exhibition/fantastic-worlds/sea-change.

[77] See Rozwadowski, "Chapter One: Fathoming the Fathomless" *Fathoming the Ocean*, 3-35.

that inspired one of the most imaginative stories of the deep ocean ever told. Residing in the pages of the 1870 science-fiction masterpiece, *Twenty Thousand Leagues Under the Sea* by Jules Verne (1828-1905), was Maury's influence. As the French novelist wrote, he kept a copy of Maury's book at hand for reference and established Maury himself as a reverential character in the novel. [78] In one sequence, Captain Nemo echoes Maury's sentiments of the ocean as a living being. "It has a pulse, arteries, spasms; and I agree with the learned Maury, who discovered in it a circulation as real as the circulation of blood in animals."[79] In chapter XI, Verne incorporates Maury's research into the book when discussing navigating the Nautilus through the kelp mats of the Sargasso Sea: "This kelp or varech, or berry-plant, is the principal formation of this immense bank," he writes. "And this is the reason, according to the learned Maury, the author of 'The Physical Geography of the Globe,' why these hydrophytes unite in the peaceful basin of the Atlantic."[80] Verne's reverence for "the learned Maury," paired with his penchant for threading the needle of fiction with scientific fact, provided a fresh approach to the public's quest to understand the ocean.

The first edition of the novel, published without any illustrations, was highly acclaimed as being ahead of its time for the scientific theories held within, along with the descriptions of submarine features that were at the time, primitive. The story takes its readers into the worlds of science *and* fiction, both replete with surprise and spectacle.

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[78] See Smithsonian Libraries Online, "Sea Change," accessed September 10, 2017. https://library.si.edu/exhibition/fantastic-worlds/sea-change.
[79] Verne, E-book, 162.
[80] Verne, E-book, 369-370.

Despite its initial lack of images, Verne's convinces the reader to engage visually. Early on in the book, Captain Nemo coveys to Arronax what Verne intends for the reader:

> You are going to travel through a wonderland. Astonishment and stupefaction will probably be your normal state of mind. You will not easily become blasé about the sights continually offered to your eyes. I am going to embark on a new underwater tour of the world—who knows, perhaps the last?—and revisit everything I have studied on my many travels; and you will be my study companion. Starting today, you will enter a new element, you will see what no man has ever seen before...and our planet, through my efforts, will deliver up its last secrets.[81]

Part adventure story, part marine biology textbook, Verne's literary vision in *Twenty Thousand Leagues Under the Sea*, or *"Seas"* depending upon the translator, threw open the door to the ocean as a world of hidden secrets to be explored, to be revealed, to be known, to be ascribed history. According to Friedrich Wolfzettel, Verne scholar and professor for French and Italian literary studies at the Goethe Universität in Frankfurt, Verne permitted readers to access a biodiverse world that had not been previously explored. "The formerly impenetrable veil of the ocean is lifted by means of scientistic optimism and fantastic technology," Wolfzettel writes in his book, *Jules Verne: Eine Einführung (Jules Verne: An Introduction)*, "revealing the planet's ultimate secrets as a pageant for the rapt crew, a marvel of natural history and aesthetics alike."[82] Despite being a work of fiction, throughout Verne's pages scientific processes unfold for the reader as the wonders of the natural world of the deep ocean are on glorious display. One example is when the crew happens upon the coral beds of the Red Sea:

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[81] Jules Verne, *Twenty Thousand Leagues Under the Seas*, Translated by William Butcher (Oxford, UK: Oxford University Press, 1998), 65.
[82] Friedrich Wolfzettel, *Jules Verne: Eine Einführung*, (Zurich: Artemis Verlag, 1988), 131.

> The light produced a thousand charming varieties, playing in the midst of the branches that were so vividly coloured. I seemed to see the membranous and cylindrical tubes tremble beneath the undulation of the waters. I was tempted to gather their fresh petals, ornamented with delicate tentacles, some just blown, others budding, while small fish, swimming swiftly, touched them slightly, like flights of birds. But if my hands approached these living flowers, these animated sensitive plants, the whole colony took alarm. The white petals re-entered their red cases, the flowers faded as I looked, and the bush changed into a chunk of stony knobs.[83]

Verne's talent went beyond simply integrating science into a compelling story; instead he crafted a compelling story *out of* the science. He also refused to allow the sea to become an inert epistemological terrain. It is instead imbued with a superabundance of acts of description, enumeration and cataloging.[84] In this canonical work of literature, neither Captain Nemo, nor the book's sympathetic narrator, Pierre Aronnax, lead as the main character. That role belongs to the ocean itself, assigned a spirit and agency of its own.

In that very first edition, the absence of artwork left the human imagination alone to carry the visuals and our sense of history with it. When French illustrators, Édouard Riou (1833 - 1900) and Alphonse de Neuville (1835 - 1885) came aboard to accept the

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[83] Jules Verne, *Twenty Thousand Leagues Under the Seas; Or The Marvellous and Exciting Adventures of Pierre Aronnax, Conseil His Servant, and Ned Land, A Canadian Harpooner* (Boston: Geo. M. Smith & Co. 1873), e-book, 235. This is a digital copy of a book that was preserved for generations on library shelves before being scanned by Google as part of a project to make the world 's books discoverable online, accessed May 31, 2017, https://play.google.com/books/reader?printsec=frontcover&output=reader&id=4P5cAAAAMAAJ&pg=GBS.PP1.w.1.0.0.1.

[84] See Wolfzettel, 69. For more on the character of the ocean in the nineteenth century, see also Michel de Certeau, "Writing the Sea: Jules Verne" in *Heterologies, Discourses on the Other*, translated by Brian Massumi, (Minneapolis, MN: University of Minnesota Press, 1986), 137-149; see also Lynn Barber*, The Heyday of Natural History: 1820 - 1870*, (London: Cape, 1989), Chapter 9.

task of illustrating Verne's work, the author's vision was not to be dismissed. Verne wrote in 1868, "I have received the drawings from Riou. I have several suggestions to make, which I'll mention to him by return mail. I think he needs to make the people much smaller and the rooms much larger. And he needs to add much more detail..."[85] Riou's final cover illustration captured Verne's vision, cementing the idea that humans were subordinate to the deep ocean environment and the creatures held within (figure 6).



Figure 6. *Frontispiece*. J. Verne, *Vingt Mille Lieues Sous Les Mers*. Édouard Riou, Paris, 1869. *Source:* Harvard University Library Viewer. Accessed May 15, 2017. https://iiif.lib.harvard.edu/manifests/view/drs:12326246$8i.

The visual storytelling Verne employed in both words and pictures served to bring readers to experience the deep sea alongside Nemo's guests who were being treated to it

[85] Charles-Noël Martin, *La Vie et l'oeuvre de Jules Verne,* (Paris: Michel de l'Ormeraie, 1978), p. 176.

for the first time. When visitors to the *Nautilus* witnessed the iron plates opening, a view of the 'unexplored abyss' and illuminated world of wonder behind glass greeted them (figure 7). It was at once theater, aquarium, and dream. The transference of tension and excitement from character to reader as Verne reveals the ocean as place is built in the following passage:

> We remained mute, not stirring, and not knowing what surprise awaited us, whether agreeable or disagreeable. A sliding noise was heard: one would have said that panels were working at the sides of the *Nautilus* . . . Suddenly light broke at each side of the saloon, through two oblong openings. The liquid mass appeared vividly lit up by the electric gleam. Two crystal plates separated us from the sea . . . What a spectacle! On each side a window opened into this unexplored abyss. The obscurity of the saloon showed to advantage the brightness outside, and we looked out as if this pure crystal had been the glass of an immense aquarium . . . For two whole hours an aquatic army escorted the *Nautilus*. . . Our imagination was kept at its height, interjections followed quickly on each other. Ned named the fish, and Conseil classed them. I was in ecstasies with the vivacity of their movements and the beauty of their forms . . . Suddenly there was daylight in the saloon, the iron panel closed again, and the enchanting vision disappeared. But for a long time I dreamt on till my eyes fell on the instruments hanging on the partition.[86]

[86] Verne, E-book, 123, 127.



Figure 7. *Aquarium*. *Vingt Mille Lieues Sous Les Mers.* Alphonse de Neuville. Paris, 1869. *Source:* Harvard University Library Viewer. Accessed May15, 2017. https://iiif.lib.harvard.edu/manifests/view/drs:12326246$11.

Earlier in this chapter, I introduced the ocean as a liminal space. Here, the *Nautilus* itself emerges as a liminal space, a physical and metaphorical vessel that plies the waters between knowledge and experience, science and spectacle. And what we discover there creates a power dynamic with the ocean that Westerners struggle with today, still.

Verne drew his first underwater inspiration for this scene from his 1867 visit to the World's Fair in Paris where he witnessed his first aquarium, referring to it as "a marvel technology paired with the wonders of nature."[87] In this gigantic crystal chamber, surrounded by water suffused with light and life, one felt as close to wandering the ocean floor and witnessing the secrets of the deep as ever imaginable. More so, it was a pivotal

[87] See Adamowski, 79.

experience that transferred the ocean's power to that of the observer.[88] In this liminal space of the aquarium, the "reality" of the ocean that a viewer beholds through glass becomes modified through technology and design, granting a sense of ownership of that environment, a theme I will explore later at greater depth.

In *Twenty Thousand Leagues Under the Sea,* this "aquarium" scene is a critical moment as it is the first time agency seemingly shifts from ocean to Nemo and his visitors. I use the word "seemingly" for good reason. Through a filmmaker's lens, it is easy to draw ontological parallels between Verne's method for reducing the boundlessness of ocean space to a visibly digestible and relatable sphere, and how documentary (specifically environmental) filmmakers communicate to the public through visual media.

To appreciate this fully, we turn to the notion of "the gaze," first introduced by Sartre and popularized by Jacques Lacan to express the anxious state of self-awareness

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[88] For more on the history of the aquarium, see for example, Bernd Brunner, *The Ocean at Home*, (New York: Princeton Architectural Press, 2003), 99; Bernhard Klein, *Victorian Studies* 48, no. 4 (2006): 709-11, http://www.jstor.org/stable/4618914; Christopher Hamlin, "Robert Warington and the Moral Economy of the Aquarium," *Journal of the History of Biology* 19, No. 1 (1986): 131-53, http://www.jstor.org/stable/4330960; Nick Dakin, *The Macmillan book of the Marine Aquarium*. (New York: Macmillan Publishing Company,1992); Philip Henry Gosse, *The Aquarium: An Unveiling of the Wonders of the Deep Sea,* (London: John Van Voorst, Paternoster Row, 1854); Harro, Strehlow, "Zoos and Aquariums of Berlin," in *New World, New Animals: From Menagerie to Zoological Park in the Nineteenth Century*, Robert J. Hoage and William A. Deiss, eds. (Baltimore: Johns Hopkins University Press, 1996), 69; Rebecca Stott, "Through a Glass Darkly: Aquarium Colonies and Nineteenth-Century Narratives of Marine Monstrosity," *Gothic Studies* 2, no. 3 (December 2000): 305–27; Stott, *Theatres of Glass: The Woman who Brought the Sea to the City* (London: Short Books, 2003); and Stott, *Darwin and the Barnacle: The Story of One Tiny Creature and History's Most Spectacular Scientific Breakthrough* (New York: W. W. Norton & Company, 2004).

when a subject is knowingly looked upon.[89] This concept was built upon by French philosopher Michel Foucault, and subsequently by media scholar Laura Mulvey, to express the assumption of power over a subject by "the looker" and the subordination of the one being viewed.[90] As Marita Sturken and Lisa Cartwright write in *Practices of Looking*, "The gaze is integral to systems of power and ideas about knowledge."[91] With regard to Nemo and his visitors, did the act of gazing upon the deep ocean, a realm hidden to them until now, transfer its supreme power to those who witnessed it?

To answer that, we consider Aronnax's musing where he states, "I was in ecstasies with the vivacity of their movements and the beauty of their forms."[92] Clearly bewitched by what he witnessed, much like the way the gaze of Medusa turned her onlookers into stone, here the ocean itself still retains its inherent power. Yet the act of peering through the window provides a sympathetic epistemic experience for Aronnax, putting him on a

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[89]Dino Felluga, "Modules on Lacan: On the Gaze," *Introductory Guide to Critical Theory,* Purdue University, 2011, accessed October 10, 2017, https://www.cla.purdue.edu/english/theory/psychoanalysis/lacangaze.html; see also Jacques Lacan, "The Split between the Eye and the Gaze,"(1964), in *The Four Fundamental Concepts of Psychoanalysis*, Trans. Alan Sheridan (New York: Norton, 1978), 67-78; Annotation of previous by Phil Lee, University of Chicago, accessed October 10, 2017, http://csmt.uchicago.edu/annotations/lacansplit.htm.; see also Marit Grotta, *Baudelaire's Media Aesthetics, The Gaze of the Flaneur and 19th-Century Media* (New York, London: Bloomsbury Publishing, 2015); see also Linda M. Shires, *Perspectives: Modes of Viewing and Knowing in Nineteenth-Century England* (Columbus: Ohio State University Press, 2009).

[90] See Laura Mulvey,"Visual Pleasure and Narrative Cinema," *Screen* 16, no. 4 (1975): 6-18; Rachael Sampson, "Film Theory 101- Laura Mulvey: The Male Gaze," October, 27, 2015, accessed October 10, 2017, https://www.filminquiry.com/film-theory-basics-laura-mulvey-male-gaze-theory/; Michel Foucault, *The Birth of the Clinic: An Archaeology of Medical Perception* (London and New York: Routledge, 1989).

[91] Marita Sturken and Lisa Cartwright, *Practices of Looking: An Introduction to Visual Culture* (Oxford: Oxford University Press, 2009), 94, 103.

[92] Verne, E-book, 124.

far more level playing field with the creatures beyond the glass; thus he begins to "understand" their world and by extension, so do Verne's readers. At least that is the illusion. Natascha Adamowski's assessment in *The Mysterious Science of the Sea* buttons it nicely:

> The combination of the glass window and the illuminated ocean night not only opens a new order of visibility; it also provokes media-ontological irritation, as it were: henceforth, gazing *into* the aquarium and looking *out of* the submarine vessel into the unknown expanses of the ocean serve as aesthetic and epistemological equivalents.[93]

This epistemic phenomenon is replicated when movie-goers are led into a new world through the cinematographer's lens. Ever since Stuart Paton (1883–1944) adapted Verne's novel for the screen in 1916, employment of the window has remained a trope for portraying diving or submarine expeditions on screen. In both fiction and documentary alike, shots through portholes and the scenes that unfurl behind them provide the basis for the visual rhetoric that illustrates our conquest of the deep.

> The visionary project of marine research, still in its infancy, took up established patterns of perception: on the one hand, technological media that made it possible to look upon, and give objective form to, alien worlds largely lying beyond the realm of human experience; on the other, the repertoire of images associated with the window as a metaphor symbolizing separation, insight, perspective and passage from one sphere to another.[94]

The idea of conquest via the gaze through a window also translates directly to the aquarium experience, yet another liminal space. Standing on a viewing platform, passively observing the spectacle behind the glass, viewers straddle two worlds, both

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[93] Adamowski, 80.
[94] Wolfzettel, 69.

immersed in, yet separate from the experience. In this case, the power lies fully with the observer to remain, or simply walk away.

The sea in Verne's novel is not only a place of wonder, but additionally a realm of terror as depicted in the book's infamous battle-scene with the voracious squid-like character he refers to as "poulp" in chapter 18 (figure 8). Yet, Verne's description of the beast also reflects an enthusiastic fascination for the animal as a scientific specimen and conveys a pervasive curiosity that borders on reverence.

> Before my eyes was a horrible monster worthy to figure in the legends of the marvellous. It was an immense cuttlefish, being eight yards long . . . Its eight arms, or rather feet, fixed to its head, that have given the name of cephalopod to these animals, were twice as long as its body, and were twisted like the furies' hair. . .What a freak of nature . . . Its spindle-like body formed a fleshy mass that might weigh 4,000 to 5,000 lbs; . . . Yet, what monsters these poulps are! What vitality the Creator has given them! What vigour in their movements! And they possess three hearts! Chance had brought us in presence of this cuttlefish, and I did not wish to lose the opportunity of carefully studying this specimen of cephalopods. I overcame the horror that inspired me; and, taking a pencil, began to draw it.[95]

[95] Verne, E-book, 467-469.

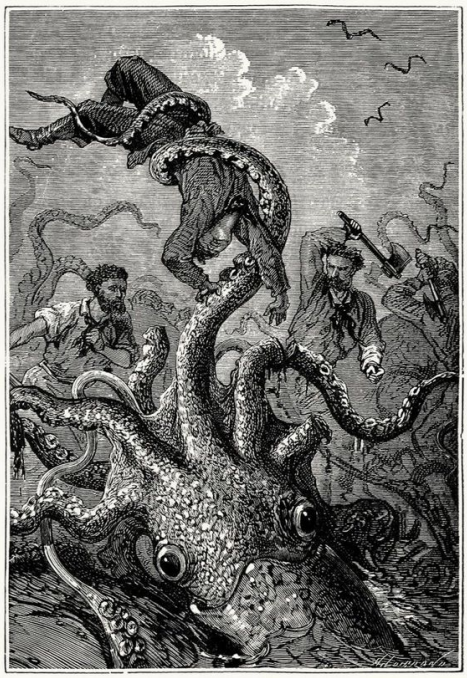


Figure 8. *Poulp. Vingt Mille Lieues Sous. Source:* Harvard University Library Viewer. Accessed May 15, 2017. https://iiif.lib.harvard.edu/manifests/view/drs:12326246$410i

Though a work of fiction, albeit heavily based upon Maury's research, Verne's enthusiasm for ocean science and exploration reflected the global pulse of the time in terms of the quest to learn more about the deep sea. And in December of 1872, that drive would culminate in the launching of the greatest oceanic expedition of its time. the Expedition.

The *H.M.S. Challenger,* a British warship borrowed from the Royal Navy, was selected for the unprecedented mission of studying the world's oceans. Modified for the scientific work to be undertaken aboard, guns were removed and replaced with biological and chemistry laboratories, tanks, and machinery for dredging, sounding, surveying, and collecting. For nearly four years, and over the course of 68,890 nautical miles, the expedition would circumnavigate the globe, gathering data at 362 oceanographic stations,

setting records for sounding at depths of 4,475 fathoms, and return with approximately 7,000 specimens, of which more than half were cataloged as new to science in the 29,500 page tome that was twenty-three years in the making, the *Challenger Reports.*

Though many would credit *Challenger* as the genesis of the field of oceanography, it could not have been possible without the seminal work of those who came before. "Although its fifty-volume report arguably serves as the intellectual foundation of the field," writes Rozwadowski, "the expedition itself represented the culmination of mid-century questions, practices, and traditions of ocean investigation."[96] It was an expedition that sailed from the shoulders of those who, through trial, error, and the arduous process of science, wrote the prequel to its story.

Much of what the public gleaned visually from that seminal expedition was due to the scientific illustrations by the zoologist-artists who classified and captured every detail of each spectacular specimen. These were men such as Ernst Haekel (1834 - 1919), famed for the popularization of Charles Darwin's work; William Evans Hoyle (1855 - 1926), whose cephalopodic monographs from the expedition are just as popular today; and the *Challenger's* official secretary and on-board artist, John James Wild (1812 - 1900), (figures 9-11).

[96] Rozwadowski, *Fathoming the Ocean,* 168.

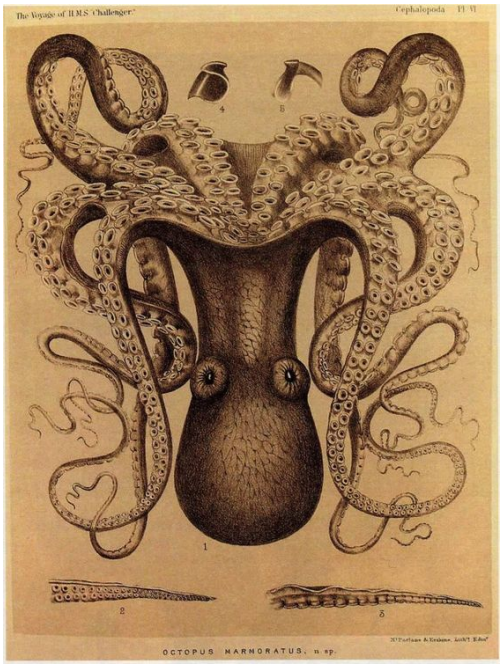


Figure 9. *Octopus Marmoratus from The Voyage of HMS "Challenger,"* William Evans Hoyle, 1886. *Source:* 19th Century Science. Accessed May 15, 2017. http://www.19thcenturyscience.org/HMSC/HMSC-INDEX/index-illustrated.htm

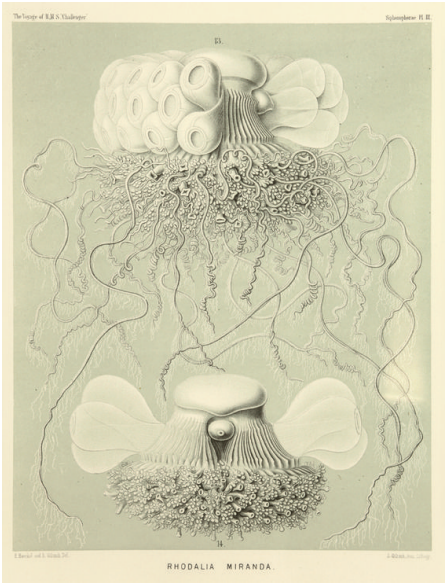


Figure 10. *Rhodalia Miranda from The Voyage of HMS "Challenger,"* Ernst Haekel 1882. *Source:* 19th Century Science. Accessed May 15, 2017. http://www.19thcenturyscience.org/HMSC/HMSC-INDEX/index-illustrated.htm



Figure 11. *Pseudocarcinus Gigas from The Voyage of HMS "Challenger,"* James J. Wild 1882. *Source:* 19th Century Science. Accessed May 15, 2017. http://www.19thcenturyscience.org/HMSC/HMSC-INDEX/index-illustrated.htm

The manifestation of the ocean in western paintings and drawings, legends and literature created a powerful impact on defining our relationship with the sea; one that the world would not see to this level of oceanographic excitement again until nearly a century later. "Scientists, as carried away by popular culture as their contemporaries," writes Rozwadowski, "swiftly made the ocean a focus of their attention."[97] As nineteenth century scientific expeditions began to shift our concept of the ocean, another fundamental shift had taken place in terms of the way scientists were approaching and communicating their research. Not only did scientific expeditions yield factual evidence about the sea, they also established distance between scientists and their research subject that became the standard for scientific objectivity. "Henceforth, nothing but firsthand observation would suffice," writes John Gillis in Islands of the Mind. "The authority of

[97] Rozwadowski, *Fathoming the Ocean,* 215.

the eye was established and the focus was now on the facts."[98] Long held secrets of the deep now revealed through the eye of the scientist offered the public indisputable "proof" of a biodiverse environment that was no longer beyond reach. And when something is within reach, it can become claimed as one's own.

"To see is to know," remarked nineteenth century American ichthyologist, science historian and museum administrator, George Brown Goode (1851 - 1896) in *The Museums of the Future*. Goode's comment likely stemmed from what he had witnessed via the public's reaction to various displays and exhibitions he oversaw for the Smithsonian Institution as well as the global expositions that he helped administer. When we cast our eyes on something for the very first time, especially when it is couched in the sphere of the scientific, it makes an indelible, indubitable imprint. Making a visual connection to a subject alters our relationship with it and crystallizes a connection. But "seeing" is only one sensory aspect of an experience – of what defines something as real. The old adage of seeing is believing may be true, but believing and knowing are very different things. The eye can betray as much as it can affirm.

Despite initial hype, by the end of the nineteenth century Americans' interest in the ocean began to wane and their focus steered back to the land. Railroads were now crisscrossing the country, carrying people to explore the inland reaches of their terrestrial domain and the age of the automobile was just dawning. "The ocean's depths lost their hold on the Anglo-American cultural imagination," writes Rozwadowski. "By the end of the nineteenth century, the sea floor, and increasingly the intermediate waters, aroused

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[98] Gillis, 106.

the interest of only a handful of oceanographers."[99] By this time, the "frontier mentality" had taken root as it was a century of great terrestrial exploration and westward expansion. Men such as William Clark, John Wesley Powell, and Jedediah Smith set out to "discover" and or tame the western region of a continent that was an "immense, mysterious, and dangerous unknown."[100] I will explore how this frontier mentality became transferred to the sea, to science, and to the media in Chapter Three.

Despite fading interest, it was through the spyglass of real or imagined experience with the ocean over the course of this century that Westerners came to "view" the seascape, the first step in establishing a history with it. "Nature was finally coming into its own as something worth paying attention to as a reality rather than as symbol," writes Gillis in *Islands of the Mind*.[101] In terms of visualizing the ocean, westerners had reached a point of no return. There was no way to "unsee" the oceanic world the public had been exposed to through the lens of science. But I contend that imagination is a commanding force and not to be discarded, especially in terms of storytelling. The American narrative of the ocean was by no means *replaced* in the 19th century; rather, it was expanded upon. Yet, it remained a story in which we could not truly insert ourselves into because we did

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[99] Rozwadowski, *Fathoming the Ocean,* 217.
[100] Kroll, "Introduction," *America's Ocean Wilderness,* 1-8. For examples of parallel works on the American frontier, see Gary J. Hausladen, Ed., *Western Places, American Myths: How We Think about the West* (Reno: University of Nevada Press, 2003); Katherine G. Morrissey, *Mental Territories: Mapping the Inland Empire* (Ithaca, NY: Cornell University Press, 1997); Henry Nash Smith, *Virgin Land: The American West as Symbol and Myth* (New York: Vintage Books, 1950) also Richard W. Etulain, *Re-imagining the Modern American West: A Century of Fiction, History, and Art* (Tucson: University of Arizona Press, 1996); Jay H. Buckley and Jeffrey D. Nokes, *Explorers of the American West: Mapping the World through Primary Documents* (Santa Barabara: ACC-CLIO, LLC. 2016), xi.
[101] Gillis, 103.

not have influence over it -- at least not yet. Imagination, curiosity and personal history are all elemental components of art, literature and indeed science and serve to define and redefine what we know -- or think we know. Mack writes, "the history of any one sea becomes the history of others."[102] But this concept can be limiting at least, and dangerous at most, as it corresponds only to what is in our periphery. What about the world beyond the one we "know?" What about the pages of history that aren't revealed to us? If knowing a place means it is ascribed a history, are the places we don't know, then, ahistorical?[103] Further, if we don't know everything about a place, then how can we in a historical sense truly assume to know *anything* about it? I argue that the first step in coming to know the ocean is attending to those whose history with it reaches far beyond the western scope.

Wayfinding Mare Nostrum

That the sea is as real as you and I, that it shapes character of this planet, that it is a major source of our sustenance, that it is something we all share in common wherever we are in Oceania, all are statements of fact. But above the level of everyday experience, the sea is our pathway to each other and to everyone else, the sea is our endless saga, the sea is our most powerful metaphor, the ocean is in us. (Epeli Hau'ofa) [104]

We have explored the concept of *mare incognitum* -- the sea as an "unknowable space" and how Americans came to develop a relationship with it through its portrayal in

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[102]Mack, 20.
[103] See Eric R. Wolfe and Thomas Hylland Eriksen, *Europe and the People Without History* (Berkeley and Los Angeles: University of California Press, 1982).
[104]Epeli Hau'ofa, *We Are the Ocean: Selected Works* (Honolulu: University of Hawaii Press, 2008), 58.

art, literature, and the popularization of science in the mid-nineteenth century. But there are those for whom the ocean was never "unknown;" people whose voices we rarely listen to, but whose lives are tied to each ebb and flow. This is an important story to tell as it forms a very different narrative than the one the Western world has subscribed to. In fact, it is the polar opposite narrative: the ocean as *mare nostrum.* Further, it is the narrative that shapes "the work my work needs to do."

Much of the research gathered for this section was conceived in tandem with a feature documentary film project called *Our Blue Canoe* (2016) for which I was the writer and story producer. Countless conversations with dozens of South Pacific Islanders over a period of three years as I worked and traveled with them, provided fodder not only for this dissertation, but the proper gestation for my work to develop the Ocean Media Institute.

Our Blue Canoe

While working on the feature documentary film, *Our Blue Canoe* (2016), I had the opportunity to accompany over one-hundred Pacific Islanders from over a dozen different island nations who were for the first time in history, sailing as a fleet across the Pacific in seven traditional hand-hewn double-hulled voyaging canoes called *vakas* (see figure 12). Mapping their way by celestial navigation, their mission, which they referred to as *"Te Mana o te Moana"* or "The Spirit of the Ocean" was to reignite interest in their voyaging heritage, teach younger members of the crew the art of traditional wayfinding, and share a message of the critical importance of ocean stewardship and their role as

people of the Pacific in turning the tide. This was not intended to be a "reenactment" of an ancient voyage, but rather a contemporary journey undertaken in the wake of their ancestors.



Figure 12. Voyage of *Te Mana o te Moana*. Pacific Voyagers fleet approaching Hawai'i in 2011. *Source:* Production Photo, *Our Blue Canoe.*

Though most elements of this odyssey reflected the traditional, modern alterations were made where deemed appropriate. For example, each *vaka*, over twenty meters long and seven meters wide, with twin hulls sleeping up to sixteen people, was structurally similar to those of ancient seafarers, but had been newly constructed using eco-friendly materials and outfitted with the addition of a special “mechanical” feature: solar panels connected to a whisper-quiet engine to power lights when they needed it, or for a motorized boost out of a busy harbor. It was to be a story as ancient as it is modern, as sacred as it is scientific.

Many of us are familiar with the story of an ancient, seafaring people who more than three-thousand years ago, set out to explore and colonize the Pacific. "There are peoples," writes John Gillis in *Islands of the Mind,* "most notably the Polynesians, for

whom the sea was very much a place with its own landscapes, complete with known features providing orientation as well as direction."[105] Making their way by celestial navigation and dead reckoning, they relied on the stars and waves, wind and wildlife to guide them. In *The Sea and Civilization: A Maritime History of the World,* Lincoln Paine explains,

> That people were able to make so many minute landfalls again and again was due to their outstanding familiarity with the ocean environment and their ability to 'expand' the size of their intended landfalls by relying on phenomena other than direct visual contact with their destination. This esoteric knowledge was transmitted orally to a select few from one generation to the next.[106]

Centuries later, when European sailors first ventured across the Pacific to "discover" new lands, they first discovered a continent of water. Covering nearly a third of the earth's surface, an area of more than sixty-million square miles, the Pacific ocean basin is larger than the landmass of all the continents combined, and the deepest on our planet, reaching downward to more than 36,000 feet in the Mariana Trench.[107]

With a distance spanning nearly ten-thousand miles from Ecuador and the Philippines, European explorers were astounded not only by how expansive it was, but by the sheer number of small islands that were for the most part, inhabited. "Islands had previously belonged to the fluid indeterminate world of the sea," notes Gillis, "always appearing and disappearing, hard to pin down. They were more easily imagined than

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[105] Gillis, 9.
[106] Lincoln Paine, *The Sea and Civilization: A Maritime History of the World* (New York: Random House, 2013), 18.
[107] See NOAA: "One Ocean Many Features," http://oceanexplorer.noaa.gov/facts/pacific-size.html accessed May 25, 2017.

located with great precision."[108] This is due partly to the fact that islands were fickle points on early maps, shifting about and changing size and position, featured on some and not on others. As quickly as a pin could mark a spot of "terra firma" in the sea of blue on one map, it would disappear on another.

The notion of Pacific sailors voyaging and maintaining contact between such small and remote islands over such distances has long fascinated and befuddled historians and anthropologists alike. Paine notes,

> The islands of Oceania form the locus of the oldest, most sustained and perhaps most enigmatic effort of maritime exploration and migration in the history of the world. They are sprinkled across some thirty-nine million square kilometers of the Pacific -- an area larger than the continent of Africa -- from the Solomon Islands just east of New Guinea to Easter Islands (Rapa Nui) five thousand nautical miles to the east, and from Hawaii in the north to New Zealand in the south.[109]

This twenty-first century voyage carried the fleet over forty-thousand nautical miles, from New Zealand to the Marquesas and Tahiti, north across the equator to Hawaii, east to San Francisco, down the west coasts of the United States, Mexico, and Costa Rica, west to the Galapagos Islands and after nearly two years, finishing the journey together in the Solomon Islands before returning to their home islands. Wayfinding in the Pacific without use of GPS requires acute navigational ability and a breadth of scientific knowledge. It is a practice that pulls together astronomy, meteorology, ecology, biology, and oceanography. Pacific navigators must be able to read the waves, swells and wind and understand how their patterns shift when

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[108] Gillis, 105.
[109] Paine, 13.

approaching land; they need to understand cloud formations and what they signify; they must recognize species of land-nesting birds and know the distances they would fly from their home; they need to read the migration patterns of whales and dolphins and know what species of fish are endemic to an area. They must memorize the position of every known island in relation to every other one.

As the earth rotates, every star rises over the eastern horizon, arcs across the sky and sets on the westerly bearing. Maori Navigator Jack Thatcher explained to me in an interview that these two points on the horizon where a particular star rises and sets remains the same throughout the year, though the time they appear changes by four minutes every night. If one can commit to memory all the stars and their positions, the time at which they are to appear and set on a particular night, and their bearings as they break the horizon or slip beneath it, one will be able to envision the sky as a 360-degree compass, with the canoe, itself, as the needle. "We have a star compass, which is basically a representation of the horizon broken up into what we call houses," says Thatcher. "And the houses help us to keep the waka on track. . . the canoe becomes an instrument."[110] It seems complicated, and it is. Paine writes,

> Just as exploration and settlement of Oceania were unique accomplishments in world history, so were the navigational practices employed. At the most basic level, the essential elements are shared by navigators everywhere: observation of heavenly bodies . . . reading the wind and water, and tracing the behavior of birds, fish, and whales. What distinguishes the Pacific argonauts is the relative importance they attached to the phenomena and the degree to which they consolidated their observations in a coherent body of knowledge without recourse of writing.[111]

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[110] Jack Thatcher, interview with author, Tahiti, May 2011.
[111] Paine, 17.

Through the development and production of the film, I spent three years becoming acquainted with many of these islands and their people by traveling with them, sharing meals with them, singing and dancing with them, talking with them. The fleet was comprised of seven *vakas,* crewed by Cook Islanders, Tahitians, Fijians, Samoans, New Zealand Maori, and one *vaka* that the voyagers jokingly referred to as the "U.N. *vaka*," with members from Tonga, Vanuatu, Kiribati, Solomon Islands, Hawaii, and other islands that rotated throughout the voyage.

Ranging in age and experience, the crew was comprised of men and women who were fishermen and artists, teachers and farmers, sailors and students. While some were life-long seamen, others were getting their first taste of the open ocean. But as diverse as their individual lives were, they shared one voice, one vision.

Tua Pittman, the chiefly Master Navigator from the Cook Islands became a friend and mentor and taught me more about Pacific Island culture than I could glean from all the literature about "them." In one of our first conversations, I asked him why they were embarking upon this journey. His response encapsulated what it meant to know the ocean, to have a history with it:

> A long, long time ago, way before the Columbuses and the Captain Cooks and the Magellans, and those who came through the Pacific, our people were already traversing the ocean. They already knew how to read the stars, they knew from standing on a beach, where Raiatea was, they knew where Aotearoa was, they knew where Hawai'i was, they knew where Rapa Nui was. And we haven't even touched on the intelligence and the valor of those who were before us. The fact that we are just able to go out and grasp a little bit of the knowledge that our *tupuna* had, is not honoring us, it is honoring them. . .
>
> Those that will be sailing on these canoes are there to bring about an awareness and an awakening to everybody out there, to let them know that within the Pacific, there are a lot of people who are really worried

> about what is happening to the ocean. This is a beautiful way to let them know, that through the unity of these seven canoes, there is an identity that they carry, and that is the identity of the people of the Pacific. All the Pacific island people have been taught to look after their environment and if we combine that with what is happening scientifically within the islands, then maybe we can get this message across.[112]

For Tua and the others that were embarking on this voyage, the ocean was not a frontier for discovery, but simply "home" as it had been for thousands of years. "It's the pride of knowing who you are and that you are *of* this ocean," Tua tells me. "You are of the people of this place -- this very, very special place that you don't want to lose; that you don't want to hurt."[113]

By the time Europeans were ready to stray beyond the shore themselves, they had already crafted an image of the lands that would be explored. In their own minds, the explorers were not set to embark into an unknown realm, but a "space with which they were all too familiar," states Gillis. He further offers,

> The European Age of Discovery in the fifteenth and sixteenth centuries was founded almost entirely of illusions that had been nurtured over hundreds of years by landlocked people who had no real knowledge of what lay beyond the edge of the world.[114]

The power of that mythical image of island geography ruled the reality of the day and shaped the course of the explorers' collective mission, which was not necessarily to discover new worlds, but to recover old ones. "Exploration did not involve looking for something new, but of searching for what was already known."[115] To those living in the fifteenth century, the world was a finite place, containing all that was or could ever be

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[112] Tua Pittman, interview by author, Honolulu, HI, May, 2011.
[113] Ibid.
[114] Gillis, 45.
[115] Gillis, 46.

known.

It was also a time of "islomania." Maps of the time were freckled with legendary islands that would surely be found one day. Continents had not been conceived of yet; every body of land, whether real or imagined, was an island separated by one great sea (figure 13).

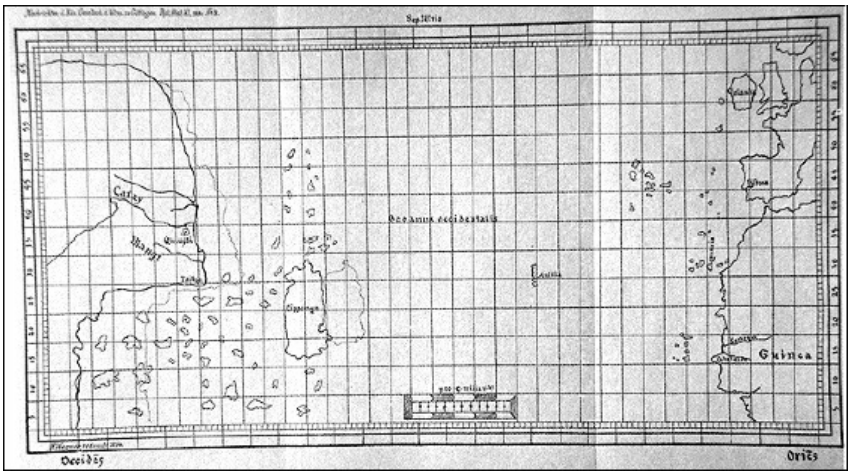


Figure 13. Reconstruction of *Toscanelli's World Map.* Paolo Toscanelli**,** 1474. *Source:* Cartographic Images. Accessed May 18, 2017. cartographicimages.net/Cartographic_Images/252_Toscanellis_World_Map.html.

The people of pre-colonial Polynesia, however, held a very different view of the ocean. To them it was a connector, rather than a barrier dividing islands. "Their universe comprised not only of land surfaces, but the surrounding ocean as far as they could traverse and exploit it," writes Epeli Hau'ofa.[116] But this view of the ocean is not just a concept of the past for Pacific peoples; it is very much a truth they hold to this day. It is referred to by the Maori as *ala moana,* the path to the sea. Hannah Rainforth, a Maori

[116] Epeli Hau'ofa,"Our Sea of Islands" *A New Oceana: Rediscovering Our Sea of Islands,* Vijay Naidu, Eric Waddell, and Epeli Hau'ofa, eds. (Suva: School of Social and Economic Development, The University of the South Pacific, 1993), 7.

woman from the North Island of New Zealand who I met along my travels with the Pacific Voyagers (as group came to be known) explained it this way:

> *Ala moana* is the concept that there are a myriad of pathways joining each island going across the sea . . . pathways that our ancestors set up for us. They journeyed and voyaged and went to discover other places. So it's that idea that even though we are sitting on this massive expanse of water and can't see anything other than great big blue ocean from one side to the other, there are still ways to follow . . . We're not alone out there. And those pathways are visible and held in the minds of our ancestors, our tupuna. . .We go carrying our ancestors with us. And we go following the footsteps that they already left for us . . . This is not Aotearoa alone. This is not us quietly sitting at the bottom of a big blue anymore. This is a spider web of ways of reaching out a connection to those other places.[117]

There is another element that adds to the phenomena; one that can only be described as alchemy of intuition and spirituality. It is the idea of a navigator "seeing" the island in their mind. Before even starting a voyage, celestial navigators root its image firmly in their consciousness, using it as a reference point when other resources fail them. It is clear that to the Polynesians as well, "to see is to know." After a cloudy, starless night, I asked Tua to let me in on the secret of celestially navigating in inclement weather. His response:

> You have times on voyage where you have to really dig deep, when there is just nothing to use -- it is totally overcast, and you can't see anything, and you have to draw on your senses . . . All of a sudden you're in a lonely, lonely place, and you're trying to search deep within your soul, deep within your mind. You go into a very quiet private little place. You know, I look into the ocean and I look up at the horizon and I see all these different faces. . .You call them to come and help you. Your eyes open again and your vision comes back and although you can't see the stars . . . you just keep pushing you keep directing that canoe in the direction that you think is the right way from what you learned and where you've seen it in your mind. And when a star pops out and it is right where it is supposed to be, the satisfaction of seeing that is enormous . . . I know a lot of

[117] Hannah Rainforth, interview by author, Honolulu, June 2011.

navigators feel that same thing.[118]

Tua was one of four *Pwo* navigators embedded with the fleet. Some will use the title, *"Pwo"* interchangeably with that of Master Navigator, but they are by no means the same. The fundamental difference is that one doesn't *achieve Pwo,* one *receives* it. It is a status that comes with great responsibility and one that is passed down ceremoniously from one who has previously been initiated. There are currently less than a dozen *Pwo* navigators in the world -- and for good reason: you need not only master the skill of navigation, but also the art of true leadership.

In 2007, *Pwo* Navigator Mau Piailug (1932 - 2010) from the tiny island of Satawal in Micronesia bestowed *Pwo* status on Nainoa Thompson, the current president of the Polynesian Voyaging Society and a native Hawaiian credited with the resurgence of the art of traditional navigation. In 1980, Thompson made the first traditional long-distance voyage since the fourteenth century from Hawaii to Tahiti and back again in a voyaging canoe called the *Hokule'a*. And then from 1985 -1987, Thompson celestially navigated over sixteen-thousand miles in an expedition that revisited old routes between the Cook Islands, New Zealand, Tonga, Samoa, Tahiti and the Tuamotos.[119] A year after being initiated, Nainoa returned to Satawal with Tua, where he, too, received *Pwo* from Papa Mau. I asked Tua to explain what Pwo meant to him and what his role is.

> When you receive the *Pwo*, it's an indication from the Master Navigator, now you [are lifted] to the next level of spirituality, of leadership. You're given the responsibility to make sure that your people are okay, to make sure that your canoe is safe. . . Our next step is to move this apprenticeship of navigators up to *Pwo* level that will be recognized in our south Pacific

[118] Tua Pittman, Interview by author, Kualoa, HI, May, 2011.
[119] Personal conversation with Nainoa Thompston, Honolulu HI, May 2011; See also Paine, 19.

> waters. We need to bring the art of traditional navigation back so we will never lose it again, ever. Mau told [Nainoa and I] and others who have reached Pwo Navigator status, 'I will only share this with you if you promise to share it with others. If you take this to the grave with you, I will not give you this knowledge.' We promised him that we would share, and we have . . . Because we have these *wakas* and we have experience, we've made this Pacific Ocean a smaller place. [120]

The inherent responsibility to share knowledge shapes the mission of these people; it is the cornerstone of their culture. This is something that deeply resonated with me in terms of my own educational philosophy, yet it's easy to miss. It is far more than merely sharing information; it is instilling the *duty* to do so -- a subtle but important difference.

Something that was repeated often on the voyage was that *Pwo* is the embodiment of "the light" of the community. The navigator's role extends beyond the canoe and is truly that of a leader of his community, where the principles of wayfinding are reinforced. "You have to navigate your way through family issues, through professional issues . . . through life," Tua tells me. He continues:

> All of that ties into the same principals of how you keep the family together on the canoe, how you set your directions, how you anticipate what type of weather is going to come, how you look after you canoe when you are in the worst conditions, or in the happiest conditions . . . And that is the power of *Pwo*, you are given the responsibility to make sure that your people are okay, to make sure that your canoe is safe, to make sure you raise more islands when the time is right.[121]

The canoe, as yet another liminal space, warrants specific discussion as it is at the heart of the connection to the ocean. There is a saying throughout the Pacific: *"He vaka he a moku, he moku he a vaka."* It means, "The canoe is our island and our island is the

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[120] Tua Pittman, interview by author, Kualoa, HI, 2011.
[121] Ibid.

canoe." It is the interface between culture and environment, self and community. Tua shares:

> The canoe has always been there, everyone throughout the Pacific knows that [it] is a very, very important part of our culture . . . the central point of everything else that happens on anyone's island. If it wasn't for the canoe, we wouldn't be there . . . For us the canoe is our mother, and we always say, she looks after us while we are at sea, so when she is on land we have to make sure that we look after her, otherwise she won't take us out again, or she won't look after us.[122]

To the voyagers, the canoe is also viewed as a microcosm of the planet. This was something of which I was starkly reminded every day while aboard. On the canoe there is finite space, limited resources. Careful consideration must be taken as to how much food and water you have to sustain you on your journey to the next island. There must be an amiable, working relationship among crew members as each person has an enormous responsibility for one another, whether navigating, steering the *hoe,* on watch, or in the galley. Nick Marr, New Zealand Maori explains,

> A voyager is not just a person who sails on the canoes. It's a responsibility that we have to our people . . . we represent our ancestors. We represent everyone who has come before us. It's our job to maintain this knowledge; it's our job to continue to teach it so that our young ones understand the importance and significance. That's not something to be taken lightly in my books. I'm responsible to them to continue this *mahi* because they've [given] the opportunity to me to learn it.[123]

In returning to the western concept of the beach as a place of abandonment, I must draw attention to the contradiction I witnessed for myself. To the people of the Pacific, the beach represents a place of homecoming. At every island we approached, as the *vaka* sailed in, a Maori woman stepped to the forward deck and began a *karanga,* a beautiful

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[122] Ibid.
[123] Nick Marr, interview by author, Honiara, Solomon Islands, 2012.

and haunting song. "When we first enter a place, we acknowledge the actual land," Hannah Rainforth explains to me in an interview. She continues:

> I'll often *karanga* to the actual land itself even if there's nobody there, just to acknowledge that place. When we get closer to land and there are people there, we will acknowledge the actual people . . . and talk about who we are. . . It's an explanation of who you are and what you're there for. . . Bringing as much *mana* to them as you can. We try to embellish our words with as many compliments as we can. It's good if you know something about the place you're going to and the people you're going to so you can weave in their stories into what you're saying. Those are the main aspects or elements of *karanga*: acknowledging the people there, bringing our ancestors with you, acknowledging those that have passed away, those who have gone on. Talking about why you're there, who you are.[124]

Often, there would be a woman on shore calling back to the vessel as a *karanga* to welcome the visitors and bless their arrival to their shores. Whenever departing an island, women from the community would stand on the beach and chant to send them off. Pua Case is one such person. She is a native Hawaiian cultural and spiritual leader, teacher and chanter. She was there on the beach to welcome the fleet as it arrived and also there to send it off when we departed. In a conversation with her, she explained her role as part of the "land crew" was to take care of the voyagers physically and spiritually, from feeding them to chanting, singing, dancing and praying over them as they arrived and departed. "The chants that I know and the understanding I have with the elements and the deities and the spirit world has shaped my life," she tells me. For her, it is about paying that spiritual gift forward.[125]

The women are not the only ones to participate in this type of ceremony.

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[124] Hannah Rainforth, interview by author, Honolulu, HI, May 2011.
[125] Pua Case, interview by author, Waimea, HI, 2016.

Following the *karanga,* the entire crew would typically engage in a *haka,* which they would write specifically for the island they were visiting (figure 14). This is an energetic display involving a chant that is often paired with the stomping of feet and slapping of chests. Maori men and women would engage in their infamous eye roll and tongue flash, asserting their dominance. The *haka* usually takes place upon arrival and is reciprocated by the hosts. *Hakas* were historically performed as an act of territoriality. The following *haka* was written by the crew of the Cook Islands *vaka, Marumaru Atua*, for their arrival in Hawai'i, while I voyaged with them. I have included the English translation below the chant.

> *Tutu te vinivini, Tutu te vanavana, Tutu te I'i.*
> *Ka mou taku oe hiii,*
> *Ka tuku ki kaui, ka tuku ki katau, tuku ki raro, ka tuku ki te rangi ... hiii.*
> *Avaiki taku tua, Avaiki taku aro, Avaiki nui e, Avaiki pou pou enua hi hi hi ha.*
>
> English:
>
> Stir up your inner passion; show forth your bravery as your skin covers itself with goosebumps of anticipation. Stir up your want for change.
> Hold on to your paddle and steer a good course.
> We will steer to the left, we will steer to the right, we will steer downwind and we will look to the heavens for guidance.
> Avaiki our sacred land is before me, Avaiki our sacred land is behind me, Avaiki our sacred land of our origin, Avaiki, you are the foundation of our existence.[126]

[126] Translated to author by Harry Goodwin, Cook Islands Maori, during 2011 voyage.



Figure 14. *Haka* performed by Cook Island Maori, 2011.
Source: Production Photo by Rui Camilo, courtesy of Pacific Voyagers.

"When we haka and we do our songs and talk about our mission, it is not a show," says Nick Marr, New Zealand Maori. " This is real, this is what we are. . . We write hakas and write songs to maintain the story [of] what we are about and what our *tupuna* were about."[127] This is an important concept to grasp. I spoke with Nick at length about ancestry and heritage and how that ties into the legacy we leave behind as individuals, as a family, as a community, a culture. Nick encapsulated the motivation behind voyaging and stewardship and the crux of the mission of *Te Mana o te Moana* in a way I hadn't considered; it is their connection to the past that propels them forward:

> The thing about voyaging is that we see the ocean. . .and we feel it, we smell it and touch it. I still want to be able to go out there and catch fish, I still want to be able to swim wherever I can . . . I have been in the ocean all my life, so it is something that I want my kids to have too, and their kids, and their kids. I think it is important when we say it is about the future.
>
> One thing that is exciting for me is that one day I will be someone's ancestor . . . I was taught the names of the people that came before . . . [all the way] back to when my people came to Aotearoa and

[127] Nick Marr, interview by author, Hanalei, HI, July 2011.

> that is an important thing for me. One day we will all become someone's ancestor.[128]

The arrival into the United States was for some of these crewmembers, a life-altering experience. Some, especially the younger voyagers, had never been outside of the Pacific, never away from their own islands. Tua shares how the visit to America re-honed the mission for many aboard the *vakas:*

> I think it set in the minds of a lot of our crewmembers that we really needed to blend our traditions and culture with the science that is out there today. Because for the longest time, our *tupuna* have been positioning themselves in a way that they knew how to look after their lands, and they knew how to look after their oceans, and they knew how to look after the creatures of the sea. But then we got westernized and we forgot about our rituals or our ceremonies and how they tied in the *marai* with the ocean and the ocean with the earth. People need to know what is happening in our part of the woods, because that is our home. If we don't make a noise now, then maybe no one will do anything about it.[129]

There is perhaps a reason why the Western world has so far blocked out the "noise" that Tua refers to. Islands themselves have always resided in a matrix of space, place, and time. In a geographical context, they were historically "easy" to categorize and their complexity was, perhaps until Darwin, misunderstood and underestimated. Temporally speaking, they reflect an idea of impermanence; lands that rise up and vanish over time. All of this has culminated into a mythologized construct that represent the "long ago and far away" -- a construct that has extended to their people. Mack writes,

> To the admirers of remote island peoples, their displacement from history was a precious gift, protecting them from the corruptions of modern civilization. But this innocence made them seem, like the children they were so frequently compared, vulnerable to the point of extinction. When consigned to a prehistorical condition island peoples were sometimes

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[128] Ibid.
[129] Tua Pittman, interview by author, Kualoa, HI, June 2011.

> identified with nature itself. But when they were recognized as peoples having a history, they were assigned to the earliest -- usually the savage -- stage of human evolution.[130]

This was a concept that plagued the voyagers when they arrived in America. They were constantly being asked by people they met if they were characters in a movie, or reenacting a scene. One afternoon, as the Samoan crew was performing a *haka* upon arrival into San Francisco, I overheard an American man exclaim to his wife, "Wow, that seemed so authentic!" Another time, we were filming from the beach in Monterey, California when a woman approached me to me ask if we were filming a historical piece. I explained that this was a contemporary voyage that had never been attempted before and asked why she thought it was historical. She replied innocently that Tua looked like "an ancient chief" and the *vakas* looked like "something out of the past." Gillis explains this phenomenon in *Islands of the Mind:*

> In terms of history, mainlands occupy the present while islands are associated with the past. Continents stand for progress while islands exemplify backwardness. Always the 'other' to mainlanders, islands serve to sustain continents' view of themselves as being at the center of world order. Until very recently, the 'quizzical eye' of islanders was unable to deflect the all-powerful gaze of visitors from the continents.[131]

As Westerners, and more specifically, mainlanders, we tend to situate ourselves in our gaze upon the "other." As Robert Bogdan states in *Human Zoos: The Invention of the Savage,* "The way we perceive individuals that do not resemble us hinges less on *their* physiological and ethnic identity than on *our* cultural identity."[132] For these Pacific

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[130] Mack, 116.
[131] Gillis, 118.
[132] Robert Bogdan, “From Specimen to Stage: The Birth of a Genre,” *Human Zoos: The Invention of the Savage (*Arles, France: Actes Sud, 2012), 73.

Islanders, stepping off their canoe and onto mainland America brought with it the challenge of not only being viewed as other, but as other relegated to the past. But there is an enormous difference between living in the past and using the lessons of the past. The Pacific Voyagers are by no means relics of some ancient culture, nor were they voyaging for reasons of nostalgia. Their aim was to introduce a new approach to stewardship that incorporated ancient wisdom into contemporary scientific methodology.

The message the Voyagers were sharing also extended to Native American communities with whom they visited. One of the most powerful testaments to their story was their reception by the Chumash people in Malibu. Mati Waiya, the Chumash ceremonial leader for the community welcomed the Voyagers with the words, "The traveling, the journey that you are taking is the loudest voice I have heard in many, many years."[133] He told them the story of his tribe and their connection with the sea and that this visit was a humbling reminder of who they were as Chumash people.

The Chumash are Native American seafaring people who are thought to have descended from *Paleocoastal* tribes approximately 12,000 years ago and have historically inhabited the central and southern coastal regions of California. From birth to death, a reverence and connection with the natural world -- particularly the sea -- tie the many distinct tribes of the Chumash together and they have distinguished themselves as the finest boat builders among the California Indians. They have always believed that their connection to the ocean was familial in addition to spiritual, as described in their creation story relayed by Mati:

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[133] Mati Waiya addressing the Pacific Voyagers and welcoming them to the Chumash village in Malibu, August 25, 2011.

> The ancestors got here on a rainbow bridge [Wishtoyo]. They were promised an abundance of land and food for a future generation as they crossed over that bridge. And they were warned not to look down because they would get dizzy and fall looking at the sparkling water below. But some of them could not resist and they looked down and they fell. And as they were falling, the Earth Goddess said to our creator, 'Save our people, don't let them die. They're good people. Save them.' So right when they hit the ocean their bodies started to sink down and their bodies started changing -- their arms came together, their legs came together, these fins came out and they went up for their first breath of air -- and they had changed into blue dolphins. So they are our brothers, our sisters, our relatives.[134]

These "brothers and sisters" shared a special bond with their human kin. Mati told a story of men setting out on fishing and expeditions, accompanied by hundreds of dolphins. "When our women would give birth on the shorelines, the dolphins would come and surround and protect them."[135] As Mati shared his stories, the Voyagers listened and chimed in with the creation stories from their own cultures. Some held similar elements of kinship with wildlife, but all were unique.

We also had the opportunity to speak with Georgina (Luhui) Sanchez, Professor of Native American Literature at California State University, Long Beach and Chumash cultural leader. In our first meeting with her, she held tight to her father's walking stick and patiently introduced herself and then her people's deep connection to the sea, beginning with the story of her name:

> I am known as Georgina Velora Sanchez, but my original Chumash name is Luhui. I am named after a very remarkable woman who was the leader

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[134] Mati Waiya shared this creation story in his welcome of the Voyagers and has also shared it in print. See Hadley Meares, "A Maritime People: The Chumash Tribes of Santa Barbara Channel," *KCET Online,* July 16, 2016, accessed December 4, 2017, https://www.kcet.org/shows/california-coastal-trail/a-maritime-people-the-chumash-tribes-of-santa-barbara-channel.

[135] Ibid.

> of the all the islands. So, when my father gave me that name so many years ago, there was a big responsibility attached to that name -- to be what he said, a wise and an astute woman; a good leader of people. My father was born in 1897 and I'm holding onto his walking stick. I'm honored to have been passed on all his regalia; his walking stick and the responsibility that goes along with that.
>
> We are islander people. Our stories place us on the islands first; that we were created on the islands by Hutash, the spirit of our mother, the earth. We were created there. And then we came to the mainland. You'll hear a lot of us talking about the ocean as 'Grandmother Ocean' -- that she gives us life; that she lives in our blood, she lives in our veins. She tells us who we are. Without the ocean, our own sense of who we are as a cultural people would disappear. So our connection to the ocean is very important.
>
> We are a planet of water. We are an ocean planet. So many times we forget that. For those of us that have this ancient connection to the ocean, it is very difficult to forget because we were shaped by the ocean -- the way we think, the way we see the world. If we were away from the ocean, it's as if we couldn't breathe. So, this worldview that the Chumash has, includes as necessary the *life* of the ocean.[136]

With tears in her eyes, Luhui then spoke directly to the voyagers and relayed the power of the their visit in emboldening the mission of her own tribe and the need for their message to be heard by the world. She stressed the importance of including the Indigenous voice in the narrative of the ocean, and the strength inherent to collective wisdom.

> I do know that the paradigm shift is taking place and the Indigenous voice is going to be absolutely necessary for us to see and to walk in this world, in a respectful, sacred, manner. I don't know how else to say that. We walk blindly through this world. We will drive along the ocean or we'll jump in and take a swim and have no respect, no appreciation, and no awareness of where we are entering and what we are doing. So, I believe that through this voyage, you are reminding us of this way of being. This respectful, sacred way of being that our world so desperately needs today. I am so grateful for the sacrifice, for the journey that you made. When we saw you sailing in, when you landed on the beach, we were greeting our family -- our blood relatives. I didn't know I was going to be so moved by

[136]Georgina Sanchez in an interview for *Our Blue Canoe,* Chumash Village, Malibu, August 25, 2011.

> that. I don't think you know how important your voyage has been for the world. And I am praying that many people are going to be listening to this story that you are telling now, because our world desperately needs to see the world from that sacred, respectful manner. I am so grateful to all of you and to the voyagers that came because we do our work here on this end, in this place we now call the United States and California, but to be re-inspired, to be reminded, to be reenergized, to be reawakened -- it's like we need each other to tell each other's stories.
>
> People will look at the ceremony, they'll look at the dances, and they'll look at the words about our collective Indigenous voice. They'll listen, they'll hear. But the greater reality and sacredness of our ocean, you know, I believe it's going to be a lot of our responsibility to continue to tell the story and to continue to remind the people. Because like I said, we live in a world that often won't.[137]

Luhui's words resonated deeply with the Voyagers and with me, personally. For those who traveled all the way from their small islands in the South Pacific, hearing that the work their work was doing was meaningful and that their voice was a critical piece to that work, provided them with a renewed energy to continue and expand on it. For me, it revealed an entirely new way of thinking about the stories we tell and the way we share them.

In the end, the crew's mission to bring the canoe to the people, for the most part, worked. Though they only reached a small portion of the American public, they were successful in sharing their story with those with whom they did have access and more importantly, engaging them in that story. They invited the public aboard for short sails, teaching them about their islands and their culture through community presentations. They shared meals and beers with them, talking about their commonalities and differences. They also participated in a three-day event in Honolulu called the Kava Bowl Ocean Summit, which brought the highest minds in ocean and climate science together

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[137] Ibid.

with the Voyagers, and the Indigenous message began to get through. In an interview with Dr. Sylvia Earle who attended the Summit in Honolulu and spent time with the voyagers, she stated,

> There's wisdom in the people who have for millennia lived close to the natural systems and understand the reliance of taking care of the natural systems that take care of us . . . the wisdom that makes it possible to have sailing canoes that can cross the Pacific, coupled with the new technologies to capture the sun and get power instead of relying on auxiliary engines that require fossil fuels. . . . It's one of the forms of wisdom that is so evident in the Pacific cultures -- caring about the past and imagining a future. If we can just move now, armed with the knowledge that goes back to ancient times, coupled with the modern technologies that give us an edge over all of our predecessors, there is hope. There is hope.[138]

Earle's testament to the power of wisdom is potent in theory, but what about in practice? Two months later, James Barry, a marine scientist at Monterey Bay Aquarium Research Institute (MBARI) who had attended the summit, had this to say to me:

> I've gone to dozens and dozens of science meetings where there's an agenda, you get up and tell your story about science . . . Then we went to the Kava Bowl meetings themselves. The first thing we did was introduce ourselves. . . The cultural difference was astounding. And the importance and value of telling stories as a context for the message that you're trying to bring across is really critical. I wanted to slap myself and say 'Gosh why haven't you been doing that for all the stories that you've been telling about the science?' Now I find myself trying to shape my message into a story that links right to the heart of the audience so that they can grasp it, bring it to their life, look at it in their terms, and decide 'is this important or not?' So those stories help it matter. I really want to bring that into my own life as a way to communicate [science] effectively.[139]

In my conversation with Barry, he hit upon the importance of telling the story of science while finding a way to make it personal. The role of empathy is too often

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[138] Sylvia Earle, Interview by author, Honolulu, HI, June, 2011.
[139] James Barry, Interview by author, Monterey, CA, August 2011.

disregarded in the sciences, yet it is one of the most powerful tools researchers can use in terms of igniting the public's understanding and engagement in science and creating a collective narrative of its story.

When we consider the process of scientific research in Western terms, we find a methodology based on hypothesis and gleaning answers to questions through observational empirical evidence. On the surface there seems nothing wrong with this approach, yet it is problematic in that it neglects history. The Scientific Revolution was built on an assumption of ignorance -- that humans don't know the answers to many important questions. This contrasts with many pre-modern traditions of knowledge that ran on the assumption that we already had the answers to everything that was important to know. According to Yuval Harari, Israeli historian, philosopher, and professor at the Hebrew University of Jerusalem, contemporary Western science is a unique tradition of knowledge as it openly admits collective ignorance regarding the most important questions. "Instead of studying old traditions," writes Harari in *Sapiens: A Brief History of Humankind, "*emphasis is now placed on new observations and experiments. When present observation collides with past tradition, we give precedence to the observation."[140] Observations, though they can inform knowledge, are not the *entirety* of knowledge. "In order to understand the universe," he continues, "we need to connect observations into comprehensive theories. Earlier traditions usually formulated their theories in terms of stories."[141] As a science communicator and filmmaker, this is

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[140] Yuval Noah Harari, *Sapiens: A Brief History of Humankind* (New York: Harper Collins, 2015), 254.
[141] Ibid.

something that I rely on in my own work and feel is necessary in terms of investing the public in science. Combining the quest for new knowledge that is embedded in modern science and pairing it with the personal story of those who have direct and historical knowledge of a place or system has fueled the inception of Ocean Media Institute's *"I Am Ocean"* initiative, which we will explore in Chapter Four.

Kaleidoscope of Knowledge

The goal of this chapter was to provide a baseline context for the difficulty Westerners have had in terms of accessing the ocean, physically, intellectually, scientifically, and emotionally. As we have explored, its sheer vastness and depth positioned it as an unknowable space, yet one that humans have been compelled to try to grasp for millennia. In our quest to make the ocean "fit" into the sphere of what is knowable -- a place with history -- Westerners contrived ways of "seeing" it through mythology, literature, art, and science. We crafted an image of the sea that shape-shifted as a construct that served the evolving western psyche and reinforced cultural norms.

All the while we were busy writing our own Western history with the ocean and making scientific discoveries that added to the breadth of its story, others were shaping, and living, a very different history with it. My work with the Pacific Voyagers has shown there is far more to the narrative of the ocean than the Western perspective. The Indigenous vision has something of great value to offer Western history and to our knowledge of the sea -- a vision I am infusing in my own work as I build the Ocean Media Institute. Returning to the importance of "accompaniment" in propelling the field

of American Studies and in terms of my work in particular, I assert that we will only come to understand the ocean holistically when we draw from all ways of seeing, whether through mythology and metaphor, literature and art, Western science and Indigenous knowledge -- each distinct in shape and color, yet presents a dynamic kaleidoscope of understanding when viewed together.

CHAPTER TWO

"POP" GOES THE OCEAN: ENTERTAINING THE OCEAN'S PLACE THROUGH BEEBE, CARSON AND COUSTEAU

At the heart of science is an essential balance between two seemingly contradictory attitudes -- an openness to new ideas, no matter how bizarre or counterintuitive they may be, and the most ruthless skeptical scrutiny of all ideas, old and new. This is how deep truths are winnowed from deep nonsense. (Carl Sagan)[142]

In the last chapter, I began my exploration into ways of coming to know the ocean and stressed the importance of listening to those who carry their knowledge differently. This chapter will dissect the way ocean science came to be popularized in twentieth-century America via three influential western storytellers: William Beebe, Rachel Carson, and Jacques Cousteau, who all relied greatly on observation to relay the story of the sea. Charting their own historical pursuits and employing the scholarship of Linda Lear, Brad Matsen, Gary Kroll, and others, I will apprise their contributions to the rise of oceancentrism and the ways they paralleled, contrasted, and fed into each other's work. I will also examine how their efforts played into and off of the popular cultural and political pulses of the times and use their varied approaches as a launching point from which assess the value of entertainment in science storytelling.

Finally, we will learn that despite their behemoth efforts to advance the public's investment in ocean science and conservation, in the end, Beebe, Carson and Cousteau still fell short in moving the needle in a lasting and meaningful way. As we come to

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[142] Carl Sagan, *The Demon-Haunted World: Science as a Candle in the Dark* (New York: Random House, 1996), 304.

appreciate the advances as well as the limitations of their work, I will punctuate the need to convey science in a way that goes beyond simply imparting information, but rather lends itself to a story that connects personally and in which people feel invested.

The Depth of Vision: William Beebe

Boredom is immoral. All a man has to do is see. All about us nature puts on the most thrilling adventure stories ever created, but we have to use our eyes. (William Beebe)[143]

"Down . . .down . . .into the depths . . .two men in a hollow steel globe. . . and while you are listening to other programs for the next hour, the Bathysphere will be going down. . . down . . .down . . .down . . ."[144] These were the words heard by Americans tuned in to their NBC syndicate on September 22, 1932, when the eminent naturalist, William "Will" Beebe (1867 - 1962) wedged himself into a crude, cramped submersible called the *Bathysphere* and drifted down into unknown darkness to 2,200 feet beneath the surface. The voice they heard was that of National Geographic publicity manager, Ford Bond, who was reporting live from the deck of the research vessel *S.S. Freedom,* stationed off of Nonsuch Island in Bermuda.[145] He introduced the broadcast as a

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[143] William Beebe quoted in Henry Osborn, Jr., "My Most Unforgettable Character," *Reader's Digest*, July 1968, 93; see also William Beebe as quoted in Jane Alexander's, *Wild Things, Wild Places: Adventurous Tales of Wildlife and Conservation on Planet Earth* (New York: Vintage Books, Penguin Random House, 2016), 138.

[144] Ford Bond as quoted in Kroll, 66; see also Brad Matsen, "Chapter 12: Voices From the Deep," *Descent: The Heroic Discovery of the Abyss,* Kindle Edition (New York: Vintage Books, 2007).

[145] This dive marked a major broadcasting milestone. Through considerable effort, NBC's engineers were able to relay the feed from Beebe's microphone in the bathysphere to NBC's facilities in New York while simultaneously sending it via a specially constructed shortwave station aboard the bathysphere's mothership to listeners in

scientific undertaking and turned the audio feed over to Beebe who described what he saw.

This was a remarkable event not only due to the scientific implications of the expedition -- no one had ever cast their eye on the ocean at that depth -- but also because it was a well-choreographed publicity stunt, crafted to ignite excitement for ocean science in the American public while avoiding sensationalism. At no point during the broadcast was it mentioned that Beebe was setting a world record, but rather focused on the scientific observations he was making himself. The broadcast concluded with Bond's words, "We have seen this great scientist actually at work, have heard his reports as they will actually later be correlated and added to the sum total of human knowledge."[146]

It worked. The audience was captivated, not so much by the spectacle of the event, but rather by the idea of being included in the process of science in the making. And that was only the beginning. Two years later, on August 15, 1934, Beebe, along with Otis Barton made the legendary descent of more than a half-mile, reaching a depth of 3,028 feet. As he peered out of the tiny porthole, one can only imagine the sense of wonder that must have consumed him. In an article for *The National Geographic Magazine,* he wrote:

> The only other place comparable to these marvelous nether regions must surely be naked space itself, out far beyond atmosphere, between the stars, where sunlight has no grip upon the dust and rubbish of planetary air,

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England and Europe. The program is one of many radio shows from the 1920s and 1930s that aired, but was never recorded. Important details of the expedition would be unknown were it not for the documentation in the NBC Collection at the Library of Congress. For more, see Bryan Cornell, "The Waters Were Boiling with Light," accessed May 20, 2017, https://blogs.loc.gov/now-see-hear/2015/01/the-waters-were-boiling-with-light/

[146] Ibid.

> where the blackness of space, the shining planets, comets, suns, and stars must really be closely akin to the world of life as it appears to the eyes of an awed human being in the open ocean a half-mile down.[147]

Beebe's first hand accounts not only served to popularize the deep ocean in a way that hadn't yet been recognized, but the *timing* of his descent in the context of American attitudes toward science and technology was pivotal in shaping how the universe beneath the waves would come to be delivered to the masses. Hailing from an era that was witness to a variety of "firsts," such as the first transatlantic flight and the race to the Poles, Beebe could not resist an opportunity to be the first person to set his gaze upon the deep sea. But he was also the first to do something else, and that was to convey the scientific wonder of the deep sea in a way that was not only accessible, but entertaining for the public. In his numerous written accounts of his deep-sea expeditions, he brought the dramas of the *process* of ocean science to the surface.

> Here, under a pressure of which, if loosened, in a fraction of a second would make amorphous tissue of our bodies, breathing our own homemade atmosphere, sending a few comforting words chasing up and down a string of hose - here I was privileged to peer out and actually see the creatures which had evolved in the blackness of a blue midnight which, since the ocean was born, had known no following day; here I was privileged to sit and try to crystallize what I observed through inadequate eyes and to interpret with a mind wholly unequal to the task. To the ever-recurring question. 'How did it feel?' I can only quote the words of Herbert Spencer: I felt like 'an infinitesimal atom floating in illimitable space.'[148]

Through Beebe's descriptions, the Western world was given their very first "real" glimpse of the deep sea and at that moment America's "view" of the ocean returned to the

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[147] William Beebe, "A Half Mile Down," *The National Geographic Magazine*, December, 1934, 704.
[148] William Beebe, *Adventuring With Beebe: Selections From The Writings of William Beebe* (New York: The Viking Press, 1955), 81-82.

Sublime. He described in captivating detail the awesome depths that held both wonder and danger all the while reflecting on his own insignificance in the deep ocean space. In *America's Ocean Wilderness*, Gary Kroll stresses, "By using the trope of the sublime, Beebe further effaced his own ego, to his own existence, to highlight the inconsequential nature of the human condition in the context of a terrifying and vast natural world."[149] Though there is validity to Kroll's assessment, I contest that Beebe's invocation of the Sublime was less a statement about the inconsequence of the human condition than it was a purposeful means to establish himself as a relatable, trustworthy and empathetic messenger to his audience. As I teach my film students, gaining an audience's trust is paramount to messaging and people relate to those they see mirrored in themselves. Beebe's admission to being "privileged to sit and try to crystallize what I observed through inadequate eyes," invites his audience to recognize him as one of them and to easily see themselves folded into that cramped space, experiencing the wonder that seized Beebe. Well aware of the role the style his writing played, Beebe stated that "it was to make real and vivid in the mind of the reader, the unearthliness of the depths of the sea."[150] His goal was to conjure a visual experience for the public, providing them with the ability, in essence, to "see it for themselves." Perhaps the secret to Beebe's success in popularizing the science was that he quite deliberately kept his ego out of it, leaving the lionizing to others who would celebrate his dangerous and heroic pursuits. To Beebe, it was the science itself that was paramount and his passion for the process was infectious.

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[149] Kroll, 68.
[150] Beebe, *The Arcturus Adventure: An Account of the New York Zoological Society's First Oceanographic Expedition* (New York: Harper and Row, 1981), 341-342.

Long before his experience in the Bathysphere, Beebe had written countless essays and articles about his scientific pursuits. He anchored his voice in a biocentric writing style, placing life, not humans at the center of the story. Though his accounts were often told in the first person, he relegated his role to that of passionate observer to the main-stage characters of the natural world. After his book *Jungle Peace* (1918) was released, Theodore Roosevelt lauded it, writing, "Nothing of this kind could have been done by the man who is only a good writer, only a trained scientific observer, or only an enterprising and adventurous traveler. Mr. Beebe is not one of these but all three."[151] His scientific prose earned him credit not only as the grandfather of modern deep ocean exploration, but the first to popularize deep ocean science. It's no wonder that William Beebe was considered more famous in the United States than any other American naturalist prior to the days of television.[152] He brought something completely new to the field of science -- entertainment value.

As popular as Beebe was in the eyes of the public, he also faced ridicule by many scientists who criticized him as a showman who displayed too much poetry and adventure and too little science. John T. Nicols, curator of fishes at the American Museum of Natural History remarked that *Half Mile Down* belonged on the fiction shelf due to Beebe's penchant for writing in dramatic fashion rather than meticulous.[153]

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[151] See Theodore Roosevelt's review of *Jungle Peace* by William Beebe in the *New York Times Book Review*, October 13, 1918.
[152] David W. Snow, *Birds in Our Life* (New York: William Sessions Limited, 2008), 212.
[153] See Robert Henry Welker, *Natural Man: The Life of William Beebe* (Indiana: Indiana University Press, 1975), 139.

Another scientist, Carl L. Hubbs from the University of Michigan, scoffed at the idea that Beebe had seen a six-foot long sea serpent, adding that it was fraudulent and even contemptible for Beebe to presume to describe and assign generic and species names for animals faintly seen through the bathysphere windows.[154] Through the history of science lens, it is easy to draw parallels between William Beebe and Carl Sagan, who faced similar attacks in the 1960s in his advocacy of science.

We must keep in mind that though Beebe was by all accounts good at his job, the 1930s was a tumultuous time in America and not all were quick to embrace science. Coming off the Great Depression, the American public searched for parties to blame and scientists seemed an easy target for their perceived role in creating "technological unemployment."[155] By the end of the decade, however, the public's attitude began to

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[154] Ibid.

[155] "Technological unemployment" is a term coined by British economist John Maynard Keynes (1883-1946) whose ideas, known as Keynesian economics, had a major impact on modern economic theories and policies. He believed our means of economizing the use of labor through technology and automation would outrun the pace at which new uses of labor could be found, a fear many still hold to this day. See John Maynard Keynes, "Essays in Persuasion," *The Collected Writings of John Maynard Keynes, Volume 9* (Cambridge: Cambridge University Press, 1978), p. 293; see also Luciano Floridi, "Technological Unemployment, Leisure Occupation, and the Human Project," *Philosophy and Technology* 27 (May 6, 2014):143–150, accessed September 18, 2017, https://link.springer.com/content/pdf/10.1007/s13347-014-0166-7.pdf; see also Irving Wladawsky-Berger, "Technological Unemployment and the Future of Jobs, *Wall Street Journal,* November 6, 2015, accessed September 18, 2017, https://blogs.wsj.com/cio/2015/11/06/technological-unemployment-and-the-future-of-work/; see also "The Impact of Jobs: Automation and Anxiety" *The Economist,* June 25th 2016, accessed September 18, 2017, https://www.economist.com/news/special-report/21700758-will-smarter-machines-cause-mass-unemployment-automation-and-anxiety; see also "The Future of Jobs: The Onrushing Wave," *The Economist,* January, 18, accessed September 18, 2017, https://www.economist.com/news/briefing/21594264-previous-technological-innovation-has-always-delivered-more-long-run-employment-

shift. In 1937, Watson Davis, the Director of Science Service, America's leading science news service, voiced the hopes of much of the scientific community by stating: "The coming (1939) New York World's Fair should be a major opportunity for . . . science popularization."[156] The Fair's theme, "Building the World of Tomorrow" provided Americans with a sense of hope by setting their focus on a new day. Davis also expressed the importance of the public's embrace of science for the *good* of democracy: "In these perilous times for so many areas of the world, we cannot reaffirm too often that the scientific way is the democratic way. The methods of science will make democracy work if they find their way to the public."[157] There is a critical caveat to this statement written between the lines, and that is Western science is inherently *undemocratic.* It is not a belief system, but based on proven knowledge. There is difference between engaging the public in the *method* of science versus engaging them in the *narrative* of that science, and the latter is what Beebe did brilliantly. The Bathysphere was proudly displayed at the New York World's Fair. Beebe's desire to stir the imagination and attract the public to the wonders of science and natural history was evident in his involvement with exhibit design that celebrated the natural world while remaining true to his message that humans were only a small part of the workings of this vast blue planet.

In the end, through his relentless work to bring the ocean to reside in the public's consciousness as a visual place -- a "real" place -- Beebe became a robust model for those

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not-less; see also John Maynard Keynes website accessed Sept 18, 2017: https://www.maynardkeynes.org

[156] Watson Davis, "The Public's Way to Science," *Science Service Papers,* Smithsonian Institution Archives, 12 July 1938.

[157] Davis, "The Popularization of Science," in *Science Service Papers.* Smithsonian Institution Archives, 4 Feb. 1937.

passionate ocean explorers who followed in popularizing ocean science; those such as Rachel Carson, Eugenie Clark, Jacques Cousteau, and Sylvia Earle. It is clear that from the very start, William Beebe knew the work he wanted his work to do.

Rachel Carson and the Rise of Oceancentrism

"There were tides in the earth, long before there was an ocean." (Rachel Carson)[158]

Post-war America was inundated by a rising tide of ocean-themed media and with it a new relationship with the sea. The ocean had become the setting for a palette of war literature, and film adaptations followed closely on their heels. Films such as *From Here to Eternity* (1953) and *The Caine Mutiny* (1954) graced the silver screen along with those based on the literary canons, *Twenty-Thousand Leagues Under the Sea* (1954) and *Moby Dick* (1956). With the advent of television in the 1950s, programs such as *Victory at Sea* (1952 - 1953), *The Gale Storm Show* (1956 - 1960), and *Sea Hunt* (1958 - 1961) flooded living rooms across the country. This resurgence of oceanic pop-culture had roots planted in something deeper. For the first time, the concept that the ocean comprised nearly two-thirds of the planet began to resonate. The re-examination of the earth as an ocean-dominated space caused a major paradigm shift among Americans, giving birth to an ideology of oceancentrism. And at its helm was a nature writer named Rachel Carson (1907 -1964).

Most are familiar with Carson via her controversial environmental classic, *Silent Spring* (1962), but it was her earlier work in marine science and writings on the ocean

[158] Rachel Carson, *The Sea Around Us* (New York: Oxford University Press, 1951), 5.

that seeded her reputation. A mentee of William Beebe, Carson was a writer who grasped the scientific method with a penchant for expressing research findings in exquisite prose. Her works, *Under the Sea Wind: A Naturalist's Picture of Ocean Life* (1941), *The Sea Around Us* (1951), and *The Edge of the Sea* (1955) all revealed the current state of scientific knowledge while transmitting Carson's own sense of awe and the majesty of her subject. Of these, her best-seller, *The Sea Around Us* warrants specific attention for its chief contribution in conveying an oceancentric view of the earth in which humans played a subordinate role to the dominant ocean -- a page she took from Beebe's book.[159] Culminating from years of meticulous research into the work of a host of ocean scientists and naturalists, paired with Carson's own scientific investigation, *The Sea Around Us was* couched in reverence for the sea.

Though she worked for years as a science writer and editor at the U.S. Fish and Wildlife Service (USFWS) in Huntington Bay, New York, Carson's first interaction with the sea was as a marine biology student in 1929, when she took a summer stint in the lab at the Marine Biological Laboratory in Woods Hole, Massachusetts. Fueled by her insatiable curiosity and enchantment with the ocean environment, Carson was a

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[159] Scholarship on Carson and her oceancentric philosophy includes, for example, Lisa Sideris, "Making Sense of Wonder" *Consecrating Science: Wonder, Knowledge, and the Natural World* (Oakland: University of California Press: 2007), 169-202; Gary Kroll, "Rachel Carson's *The Sea Around Us*: Ocean-centrism and a Nascent Ocean Ethic" in *Rachel Carson: Legacy and Challenge*, Lisa Sideris and Kathleen Lee Moore, eds. (New York: State University of New York Press, 2008), 118-135; Gary Kroll, "Rachel Carson's The Sea Around Us: The Construction of Oceancentrism" *America's Ocean Wilderness*, 95-123. For a broader intellectual and cultural examination into Carson's life, see William Souder's *On a Farther Shore: The Life and Legacy of Rachel Carson* (New York: Broadway Books 2012).

consummate student of the sea. She was known to spend her off-time either in the research library reading about the ocean, or exploring the nooks and crannies of the shoreline and tide-pools, crafting her best learning through direct and personal observation. In the book, *Rachel Carson: Witness for Nature*, author Linda Lear retells the story of Carson's biology teacher Mary Scott Skinker, who commented, "Rachel would wander off by herself, silently watching the ocean, utterly captivated by the sounds, smells and rhythm of the ocean as well as by the variety of the marine life all around her."[160] She transferred her captivation to the page, but by no means was Carson alone in infusing what she called a "sense of wonder" of the natural world into her writing; that was a style common among nature writers of the time. What she did that was unique was to take what was being gleaned scientifically about the ocean, infuse it with her own poetic observations, and plant it in a biocentric sentiment as a commentary on the importance of the sea and critical role it plays as an actor. "Carson was forging new ground, a new genre," writes Kroll. "The book [*The Sea Around Us*] was part science of the sea, part literature of the sea, and a full treatment of the ocean as an object of mysterious wonder that dominates the earth."[161] More than that, Carson was using science as the stage on which to reacquaint the world to the character of the ocean. She licensed *The Sea around Us* as a documentary film in 1952, which won the Academy Award for Best Documentary in 1953.

From early on, Carson drew connections between the earth's natural and scientific processes and their role in everyday life. Adamant in her position that science and society

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[160] Linda Lear, *Rachel Carson: Witness for Nature* (New York: Henry Holt, 1997), 61.
[161] Kroll, *America's Ocean Wilderness,* 99.

should be encouraged to co-mingle, she had this to say in a speech she gave upon receiving National Book Award in 1952:

> This notion that 'science' is something that belongs in a separate compartment of its own, apart from everyday life, is one that I should like to challenge. We live in a scientific age; yet we assume that knowledge of science is the prerogative of only a small number of human beings, isolated and priest-like in their laboratories. This is not true. It cannot be true. The materials of science are the materials of life itself. Science is part of the reality of living; it is the what, the how, and the why of everything in our experience. It is impossible to understand man without understanding his environment and the forces that have molded him physically and mentally.[162]

At the heart of *The Sea Around Us* lies a cautionary tale. In a letter to William Beebe as Carson was writing the book, she stated her belief that we will become even more dependent on the ocean as we destroy the land. The writing was on the wall: "Militarily, economically, and culturally," writes Kroll, "Americans were poised to demand a great deal of the oceans that surround the North American Continent."[163] With eyes wide open to the stresses of resource development on the land, Carson felt Americans would have no recourse but to shift their dependency to the ocean to sustain them.

In order to arrive at Carson's biocentric eco-philosophy, we must locate it in the place where science rested with the American public at the time -- the cradle of war. After World War I, science journalism came into its own as a field due mainly to the development of military technology that was an outgrowth of the war. In 1921, the Science Service (which later became the Society for Science and the Public (SSP)),

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[162] As quoted in Lear, 218-219.
[163] Kroll, *America's Ocean Wilderness,* 99.

founded by journalist Edward Scripps and zoologist William Emerson Ritter, brought the latest scientific findings to the public through the distribution of articles to over 100 newspapers in the 1920s.[164] Between the World Wars, the SSP sponsored "Science Clubs of America" which extended the goal of popularizing science to young and amateur scientists by engaging them in the scientific process through accessible experiments. But by the mid-1940s, the military application of science began to take on a more sinister tone. Though the World Wars were over, the Cold War loomed closely on the horizon of the American psyche.

After World War II, the United States and its allies vigorously searched for ways to harness natural processes in order to gain military advantage. Natural disasters piqued military interest as they proved that humans were vulnerable to the whims of nature.[165] What if, then, humans could orchestrate those whims to military advantage? That question spurred government leaders to employ scientists for the purpose of serving their country. The goal: to weaponize nature. As science historian Jacob Darwin Hamblin states in *Arming Mother Nature,* "Scientists did not yet know whether it was feasible for humans to tap into nature's pathways on a large scale, letting natural processes do the

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[164] Dissertation by Bruce V. Lewenstien, Public Understanding of Science in America: 1945-1965," University of Pennsylvania, 1987, accessed May 26, 2017, http://repository.upenn.edu/dissertations/AAI8804924/ ().

[165] Science Historian Jacob Darwin Hamblin has contributed a great deal of scholarship on the U.S. military's influence on the actions and attitudes of American scientists. See for example, Hamblin, *Arming Mother Nature: The Birth of Catastrophic Environmentalism* (New York: Oxford University Press, 2013); Hamblin, *Oceanographers and the Cold War: Disciples of Marine Science* (Washington: University of Washington Press, 2005); and Hamblin, "Focus: Knowing the Ocean: A Role for the History of Science: Seeing the Ocean in the Shadow of Bergen Values," *Isis* 105 no. 2 (2014): 352-363.

deadly work, but they were hopeful."[166] What some would view as employing scientists for nefarious means, others saw as performing a civic duty. Scientific growth after World War II boomed as a result of the enormous financial assistance lent by the U.S. armed services.

Hamblin details a legion of scenarios in which "total war" could be unleashed by conscripting nature. These include everything from radiological and biological warfare, to crop destruction, to insect and plant pathogens, to weather modification. Scientists helped their governments to push the frontiers of human mastery over nature's processes. "By the 1950's," writes Hamblin, "they began to seriously contemplate the control of large scale geophysical forces."[167] With regard to the ocean in particular, they were examining ways to alter ocean currents and generate tsunamis. While the U.S. government sought ways to militarize the ocean, Americans viewed the ocean as the planet's cure-all for the ills of war. At that time the sea was viewed as a great neutralizer with the ability to absorb noxious substances, so the threats of radiation were mitigated.[168] It was thought that fish could be caught in deep water and "cleansed" by the ocean.

The throes of war had taken a toll on the American psyche and by the early 1950s, a war-fatigued America was in dire need of a boost. The ocean for many was a place of respite and healing in the American psyche. Carson provided a balm that would ease the

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[166] Hamblin, *Arming Mother Nature*, 25.
[167] *Ibid.,* 129.
[168] Ibid., 100.

psychological stresses of war through *The Sea Around Us*. The thesis of the book rested on Carson's scientific assessment that the earth was indeed an ocean planet. She states,

> Over vast periods of geologic time the ocean had the power to weather down continents, and also had the power to create life. Granted humans have the power to destroy through war and create through science, but human efforts pale in comparison to the transformative agencies of an omnipotent ocean.[169]

By casting the sea as something so much bigger than us mere humans, Carson provided the anodyne the public sorely needed in assuaging fears. Donald Adams, a reviewer for the *New York Times Book Review* captured the popular sentiment by stating, "[The book] offered vicarious courage indomitable perseverance in the face of disheartening odds -- qualities we know we need if we are to face and overcome the obstacles, the fears and the threats by which we all live surrounded today."[170]

Lauded as an extraordinary piece of science writing, it was not so much what Carson wrote, but how she phrased it, worthy of a genre of its own, referred to by Edwin Teale as "science literature." To that, Carson responded, "The aim of science is to discover and illuminate truth. And that, I take it, is the aim of literature, whether biography or history . . . It seems to me, then, that there can be no separate literature of science."[171] Graham Netting, Carnegie Museum's Assistant Director, praised the book, noting, "What passes as science writing today is cold, thin gruel. What we obviously need

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[169] Carson, *The Sense of Wonder: A Celebration of Nature for Parents and Children* (New York: Harper Perennial, 1956),100.
[170] Donald Adams, "Speaking of Books," *New York Times Book Review*, March 22, 1953, 2.
[171] Carson, as quoted in Lear, 219.

is a new category of science classics, reserved zealously for those books that satisfy the twin criteria of imaginative research and literary craftsmanship."[172]

Carson's prose was the anchor to which the American public moored their connection in order to resituate themselves within that oceanic realm. No means oblivious to her talent as a wordsmith, she felt her lyricism partnered naturally to ocean science. In her 1952 acceptance speech for the National Book Award for Nonfiction, she stated,

> The winds, the sea, and the moving tides are what they are. If there is wonder and beauty and majesty in them, science will discover these qualities... If there is poetry in my book about the sea, it is not because I deliberately put it there, but because no one could write truthfully about the sea and leave out the poetry.[173]

Though acutely aware of the human threat to the ocean, Carson did not subscribe to an anthropocentric ideology. “It is a curious situation that the sea, from which life first arose should now be threatened by the activities of one form of that life. But the sea, though changed in a sinister way, will continue to exist; the threat is rather to life itself."[174] In my view, this statement illustrates the parallels between Carson's oceancentrism and the concept of non-human agency put forth by neo-materialists, Owain Jones and Paul Cloke a half-century later. In the article, *Non-Human Agencies: Trees in Place and Time*, Jones and Cloke make the argument that we need to rethink the definition of agency from a less anthropocentric angle and give more credence to the

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[172] Netting, Graham. "The Naturalist's Bookshelf" *Carnegie Magazine,* November 25, 1951, 320.
[173] Carson, in her address upon receiving National Book Award for *The Sea Around Us* at Hotel Commodore, New York, January 27, 1952.
[174] Carson, "Preface" *The Sea Around Us.*

power at play within non-human networks. They argue that that the term 'agency' needs to be disaggregated in order to account for the differing ways in which the global population of things can act creatively. "We believe that to rule out notions of non-human agency … may be both to lose out on significant understandings of the ways in which non-human organisms and materials contribute to the networked agencies of hybrid collectifs . . ."[175] It is my contention that Carson adhered to a neo-materialist perspective, long before Jones and Cloke entered the arena. In her view, humans would never be able to gain mastery over nature without first *learning from* nature. The ocean as a non-human actor wields enormous power. But it is in fact the shared agency between the human and natural world -- that interplay -- that further reinforces the connection between them. And that hybridity is what births the fundamental question: Can humans have a long-term effect on environment?

It is often said that what Thoreau and John Muir did for terrestrial wilderness, Carson did for the world beyond the shore. Her oceancentric writing hailed a new relationship between the public and the sea.[176] Like Beebe, Carson's philosophy was rooted in the sublime, but with a twist: it would be paired with a movement. In a speech to accept the John Burroughs Medal in 1952, she stated it plainly: "The more clearly we

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[175] Owain Jones and Paul Cloke, "Non-Human Agencies: Trees in Place and Time," *Material Agency: Towards a Non-anthropocentric Approach*, C. Knappett and L. Malafouris, eds. (Guilford: Springer, 2008), 84. For more on the neo-materialist perspective and the environment, see Timothy James LeCain, "Against the Anthropocene. A Neo-Materialist Perspective," *International Journal for History, Culture and Modernity* 3, no. 1 (April 23, 2015): 1.

[176] Jane Lubchenco, "Rachel Carson's Scientific and Ocean Legacies" in *Rachel Carson, Legacy and Challenge,* eds. Lisa H. Sideris and Kathleen Dean Moore (New York: State University of New York Press, 2008), 29-40.

can focus our attention on the wonders and realities of the universe about us, the less taste we shall have for destruction." In other words, the more humans could relate to the ocean as a place of wonder and awe, deeper would be their sense of stewardship. It was a call to action -- a call that was to be answered, at least in part, by the oceanographic exploration teams of the 1960s.

To Ebb, Flow and Boldly Go

This chapter has thus far charted the popularization of ocean science in 20th century America through the work of William Beebe and Rachel Carson. Their oceancentric philosophy provided a richer depth of field to our understanding of the sea as an active player in our relationship with the planet. Their role as advocates of ocean science was pivotal in repositioning the sea in the American mindset at the time. In this section, I intend to offer historical context for how that position manifested via ocean exploration. There was perhaps no other time in history that more closely resembled the mid-nineteenth century in terms of scientific exploration and the public's investment in it than the 1960s.

Roger Revelle of the Scripps Institution of Oceanography described the '60s as the beginning of our great age of exploration, referring to it as one of the greatest periods of exploration on earth.[177] It was at the very top of this decade, in January of 1960, that the Swiss-engineered bathyscaphe, *Trieste* carried US Navy Lieutenant, Don Walsh and

[177] Roger R. Revelle, "Director of Scripps Institution of Oceanography, 1951 - 1964," an oral history conducted in 1984 by Sarah Sharp, Regional Oral History Office, The Bancroft Library, University of California, Berkeley, 1988, Scripps Institution of Oceanography, Reference Series no. 88- 20, Nov. 1988.

Jacques Piccard (son of the vessel's designer Auguste Piccard) to what was believed, and known to this date, to be the deepest point on our planet, the Challenger Deep in the Mariana Trench (figure 15).

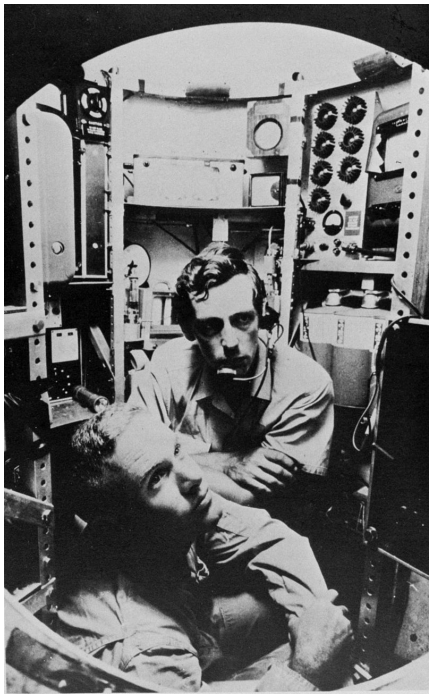


Figure 15. Lieutenant Don Walsh, USN, and Jacques Piccard in the bathyscaphe *TRIESTE*, Marianas Trench 1960, NOAA Ship Collection. Public Domain, accessed May 28, 2017, *Source:* NOAA Photo Archive, noaa.gov.

They recorded a depth of 10,916 meters (35,814 feet), though more accurate measurements put Challenger Deep between 10,911 meters (35,797 feet) and 10,994 meters (36,070 feet) deep.[178] To put that in terrestrial perspective, the highest peak on earth is Mount Everest at a "diminutive" 29,029 feet, relatively speaking -- if you topped

[178] Jonathan Amos, "Oceans' Deepest Depth Re-measured," *BBC News*, accessed May 14, 2017, http://www.bbc.com/news/science-environment-15845550

Everest with Mount Washington, you would still come up short. This was the first time a vessel, manned or unmanned, had reached the deepest known point of the planet's oceans. The descent to the sea floor took four hours, forty-seven minutes. It was an exciting, albeit harrowing expedition as at 9,000 meters (30,000 feet), one of the outer Plexi-glass windows cracked, throwing the entire vessel into a tremble and the men lost communication with the support ship. Piccard relayed in an interview with Robert Dietz:

> Everything was smooth and 12 hours and approx. 2 minutes we were at 5400 fathom and at this time we could expect the bottom anytime because *Lewis* had communicated to us before the dive that the supposed depth found by sounding was 5600 fathom. Just at this moment when we said that we should arrive in a few minutes we heard a little noise. This little noise was accompanied by a relatively strong shock which gave it a big feeling of shock to the sphere and extremely mysterious. We said, What happened?
>
> We didn't know what it could be. And the speed continued exactly the same, no increasing at all, so it was all right. We had no reason to come up but we didn't know what it could be. Don Walsh suggested at this moment that maybe we touched the bottom, but it was impossible because the speed was continuing the same and no bottom was visible . . .
>
> After 20 minutes of observation of the bottom suddenly Don Walsh, who was looking through the big [correct word?; back?] window, told me, Now I know what was the explosion before, and he showed me the back window of the antechamber. So the big one which has no difference of pressure to [inaudible] because it is the same pressure inside and outside the antechamber, had been broken, not completely broken apparently but had several cracks. Before the dive it was decided to stay about 30 minutes on the bottom, but when we discovered that the window had been cracked I realized that it could eventually give some trouble, eventually even some terribly big trouble, to get out of the sphere. [179]

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[179] This interview is from the masterful archive of the dives of the Bathyscaph *Trieste,* 1958-1963 called "The Robert Sinclair Dietz Papers 1905-1994," pp13-16. Assembled in 2000, it contains transcriptions of sixty-one dictabelt sound recordings in which Don Walsh and Jacques Piccard discuss the *Challenger Deep* expedition of 1960. The collection is housed at Scripps Institution of Oceanography, University of California, San Diego. Accessed online, June 3, 2017, http://scilib.ucsd.edu/sio/hist/Dives%20Bathyscaph%20Trieste%20Dictabelts.pdf.

The two men spent barely twenty minutes on the ocean floor, having observed a number of vertebrates including what Piccard called a small sole, proving that at least some vertebrate life can survive the crushing pressure at the ocean's deepest reaches. While at maximum depth, Walsh and Piccard unexpectedly regained the ability to communicate with the support ship using a sonar/hydrophone voice communications system. "As we had lost the contact by voice," the team reported, "we had no more much hope to hear something, but it was a big and wonderful surprise, and when we had been stopped in the bottom we could perfectly speak and understand the telephone from the *[Wandan]* topside."[180]

It was a remarkable feat of technology and human endeavor and though the *Trieste's* design was not well-suited to the needs of research scientists, it was the perfect prototype for which to develop more sophisticated research submarines. A year later in 1961, robotics began to sweep the sea, quite literally. The Scripps Institution of Oceanography began developing the first remotely operated unmanned oceanographic vehicle (ROV), the "Deep Tow System" to capture detailed images of the sea floor. It was controlled through a tethered system that was lowered from a surface vessel to just above the sea floor to obtain sea-floor slope information in the deep sea, though it eventually evolved into a system with multiple sensors for characterizing the deep-sea environment.

Seafloor mapping became fully realized when multibeam sounding instruments were developed. The first multibeam system, known as the Sonar Array Sounding System

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[180] Ibid., 15.

(SASS), was installed on the U.S. Navy Ship *Compass Island* in 1963. This technology enabled accurate depths over a swath of sea bottom that lay perpendicular to the heading of the survey ship, as well as directly beneath it. For the first time, scientists could reliably visualize the geography of the bottom of the sea.

In 1964, across the continent, Woods Hole Oceanographic Institution created the first manned Deep Submergence Vehicle, *Alvin,* to finally go where "no human previously could" in the exploration of the ocean depths, transporting scientists to the "edge of creation" in order to study processes on ocean ridge systems.[181] Still in use as of this writing, *Alvin* is unparalleled in its utility, having made well over 4,000 descents. From hydrothermal activity to cold seeps, scientists have observed for the first time from the safety of its interior, the unimaginable sedimentary and biological processes the deep sea had kept secret until then. In 1966, its discovery of a hydrogen bomb that was lost off Palomares, Spain from a U.S. Air Force B-52 that had collided with a tanker plane helped to publicize its use as an ocean observation tool.[182]

The science-fiction world of *Atlantis* seemed to make an entry into the real world in 1964 with the development of the SeaLab experiments by the United States Navy. SeaLab I was initiated to prove the viability of working at depths for extended periods of time, while reducing the risk of decompression sickness. On July 20, 1964, four divers climbed into SeaLab I before it was lowered off the coast of Bermuda to a depth of 58

[181] See "History of Alvin," Woods Hole Oceanographic Institution, accessed May 28, 2017, https://www.whoi.edu/page.do?pid=10737.
[182] See "Age of Electronics 1946 - 1970," NOAA, accessed accessed May 28, 2017, http://oceanexplorer.noaa.gov/history/electronic/1946_1970/electronic_middle.html.

meters (192 feet) of seawater, where they had intended to remain for three weeks. Unfortunately, an impending tropical storm halted the project after only eleven days.

The following year, in August of 1965, SeaLab II was launched (figure 16). This experiment would bring three rotating teams of divers 62 meters (205 feet) down into the La Jolla Canyon, which lay just off the coast of Scripps Institution of Oceanography, in California.



Figure 16. *SeaLab II* La Jolla, CA, 1965. *Source:* U.S. Navy Photo Archive, Public Domain. Accessed May 28, 2017, http://www.navsource.org/archives/08/08500.htm.

The vessel, dubbed the "Tilton Hilton" equipped with hot showers and refrigeration, was a marked improvement in luxury over SeaLab I. For this mission, the crews moved beyond running tests on physiology and also experimented with salvage methods, new tools and the function of an electrically heated drysuit. The three teams would spend fifteen days each in the sub, but one aquanaut/astronaut Scott Carpenter, would remain submerged for a record-setting thirty days.

Perhaps the most notable "crew-member" of SeaLab II, however, was a bottlenose dolphin named "Tuffy" from the U.S. Navy's Marine Mammal program who was employed with mixed results, to ferry supplies from the surface of Sealab or from one diver to another and to come to the rescue of an aquanaut in distress[183] (figure 18).



Figure 17. *Tuffy the Dolphin: SeaLab II.* 1965. *Source:* U.S. Navy Photo Archive, Public Domain. Accessed May 28, 2017, http://www.navsource.org/archives/08/08500.htm

On February 15, 1969, into the California waters off San Clemente Island SeaLab III carried its first team of divers to 610 feet (185 meters), three times as deep as its predecessor. The mission was positioned to be the most advanced of the SeaLab experiments, involving five teams of nine divers each who would spend twelve days in the habitat. But according to John Piña Craven, the U.S. Navy's head of the Deep Submergence Systems Project of which SeaLab was a part, the mission was plagued with strange failures at the very start of operations that ultimately led to the mysterious death

[183] Ben Hellwarth, *Sealab: America's Forgotten Quest to Live and Work on the Ocean Floor* (New York: Simon & Schuster, 2012), 147–148, 327.

of an aquanaut.[184] The habitat soon began to leak and four divers were sent to repair it, without success. A second attempt was made which tragically took the life of aquanaut Berry Cannon due to a problem with his rebreather, possibly coupled with hypothermia.

Craven also reported that while the other divers were undergoing the week-long decompression, someone aboard the command barge had repeatedly attempted to sabotage their air supply. A guard was eventually posted on the decompression chamber and the divers were recovered safely. Though a suspect had been identified by the staff psychiatrist, naval intelligence reported there was insufficient evidence for concluding that sabotage had played any role in the SeaLab disaster. The suspect was not prosecuted, possibly in order to avoid bad publicity for the Navy. "The case coincided with the aftermath of an unrelated event of national embarrassment for the Navy," writes Craven. "There were many that felt in the SeaLab disaster a finding of sabotage would be an additional public relations fiasco for the Navy."[185] Though the SeaLab expeditions produced mixed, and at times disastrous results, there is no question that the knowledge gleaned from the SeaLab era aided in the advancement of the science of deep sea diving as well as the understanding of the physiological and psychological pressures humans can withstand. More than that, it contributed to a new chapter in the story of the American Experience with the ocean. "The 1960s version of ocean science was intended to support a new human relationship with the sea," writes Rozwadowski, "one predicated on expectations created by scientists and engineers of the almost unimaginable number and

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[184]John Piña Craven, *The Silent War: The Cold War Battle Beneath the Sea* (New York: Simon & Schuster, 2001), 154.
[185] Ibid., 160 -161.

scale of resources available there."[186] Science itself, however, was not enough to foster this human relationship, for science on its own would not bring the public to the sea. What ocean science needed was in fact a human partner who would instead bring the sea to the public; one who would amplify the call of Rachel Carson and William Beebe. There was a singular man for the job, working on the other side of the Atlantic, in another medium. He was a French explorer who would bring the American public underwater to experience it for themselves for the first time and alter our relationship with it forever. His name was Jacques Yves Cousteau.

Cousteau's Legacy: The Captain and the Chorus

If The Silent World was such a success when it came out it was, of course, because people were beginning to have a feeling for their surroundings and a curiosity about the sea depth that no one had seen before. But it was also because I knew how to make a movie. (Jacques Yves Cousteau)[187]

There is perhaps no one in Western history who has done more for ocean awareness than Jacques Cousteau (1910 - 1997). He is a man whose red-capped legacy runs deep. From the development of the Aqua-Lung underwater breathing apparatus, to a literary contribution of more than fifty books, to 120-plus television documentaries and

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[186] Helen Rozwadowski, "The 1960s Ocean," Science and Exploitation Conference Paper, 124th Annual Meeting American Historical Association, January 2010, accessed May 29, 2017, https://aha.confex.com/aha/2010/webprogram/Paper3672.html.

[187] Cousteau's response to an anonymous New York Times reporter who asked him how he had been able to expand awareness about protecting the ocean. See Axel Madsen, *Cousteau: An Unauthorized Biography* (Cleveland: Open Road Distribution, 2015), 239; see also Brad Matsen, *Jacques Cousteau: The Sea King* (New York: Vintage Books, 2009), 250.

award winning films, to an environmental protection foundation whose members number more than three-hundred thousand, Cousteau brought the ocean to the masses. He worked the story of the narrative of the ocean in a transmedia arena decades before the term came into use. Cousteau's seminal book, *The Silent World* (1953) sold more than five million copies worldwide and was translated into 22 languages.[188] Three years after the book's release, Cousteau produced the documentary version of the book, which won the coveted *Palm d'Or* at the Cannes Film Festival, the first ever for a documentary. It went on to win an Academy Award.

Always a tinkerer, Cousteau's entry into the world of filmmaking was through his eternal quest to learn how things work. In the book, *Jacques Cousteau: The Sea King,* Brad Matsen relays the story of Cousteau's young fascination with the "new art" of cinema that was sweeping France. As a fourteen-year-old boy, young JYC (pronounced "Jeek") saved his allowance for three months to buy himself a used hand-cranked camera called a *Pathe Baby*, primarily to take it apart and see how it worked. It was not long before he was making full movies, replete with heroes, villains, and dramatic effects inspired by the cinematic masters of the day.[189] He soon realized his boyhood dreams of becoming a director seemed impractical in terms of making a living wage and decided his

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[188] See Gabriel Abad, "Undersea Exploration" in *Literature of Travel and Exploration: An Encyclopedia*, Jennifer Speake, ed. (New York: Routledge 2003), 1212; see also Biography.com: Jacques Cousteau, accessed June 1, 2017, https://www.biography.com/people/jacques-cousteau-9259496.

[189] I owe a debt of gratitude to Cousteau biographers, Brad Matsen and Axel Madsen who chronicled Cousteau's life in great detail and from whom I gleaned much of the research for this section. I am also grateful to Jean Michel and Fabien Cousteau with whom I have had numerous conversations over the years that also added to my research.

art was probably best served as a hobby. After graduating high school, he entered the French naval academy with ambitions of flying planes for the navy.

Fate intervened and in 1936, just before earning his wings as a pilot, he suffered a near-fatal car accident. It was then that Cousteau revisited his dream of becoming a filmmaker. He liked the way his camera set him apart from the rest of the world and gave him permission to look directly at people and the world around him. He was in control of his art. "He had the navy as a career, but could not set aside storytelling with his camera."[190] Yet his line of focus was not trained on the sea.

Despite making a career as a navy man, to Cousteau the ocean was never really more than an avenue between ports. But in the late summer of 1936, Cousteau's friend Philippe Tailliez, a spear-fisherman and tinkerer himself, coaxed him to strap on a pair of rudimentary home-made fins, a snorkel fashioned out of a garden hose, and goggles and put his head underwater. Struck by the world he witnessed under the ceiling of the sea -- a world where its residents were going about their business in an entirely different way than their terrestrial neighbors, Cousteau's life in that single instant shifted in its purpose. What he saw beneath the waves provided him with a new clarity of vision for the future in terms of human's relationship with the deep. He became obsessed with the ability to breathe, film, and one day, work underwater.

Joining forces with two of his equally industrious friends and partners, Philippe Tailliez and Frederic Dumas, the trio formed "Les Mousquemers," or "The Sea Musketeers," as they called themselves. Together they pushed through years of trial and

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[190] Matsen, *The Sea King,* 22.

error, spending nearly every waking minute together puzzling over ways to dive deeper and stay longer.[191] Researching and experimenting with water chemistry, pressure, light, and heat retention, the trio channeled their mania over underwater survival into technological innovation.

It was a summer day in 1943 when Cousteau, at the age of 33, stood on a small beach along the French Riviera and harnessed to his back a contraption of three cylinders of compressed air that attached to a regulator and connected to two tubes that joined on a mouthpiece. He pulled a glass mask over his eyes and nose, strapped on rubber fins and strode, clumsily, we can imagine, into the waves. What this industrious Frenchman was sporting was the first completely autonomous diving gear of his design. He modified a regulator to supply divers with breathing gas on demand and at the proper pressure, which prevented the tanks from quickly running out of air. This was the crowning piece of the first Self-Contained Underwater Breathing Apparatus (SCUBA). [192]

At long last, the invention of the Aqua-Lung was deemed a success, revolutionizing our interaction with the sea. With it, humans for the first time could dip beneath the waves with their own portable air supply and move freely -- and for fun. Cousteau writes from the perspective of a "fishman" in his book, *The Silent World,*

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[191] Ibid., 31.

[192] See for example, Brett Israel, "Jacques Cousteau Legacy Still Making a Splash," *Live Science,* June 11, 2010, accessed June 4, 2017, http://www.livescience.com/6588-jacques-cousteau-legacy-making-splash.html; Cousteau Society Website, accessed June 4, 2017 https://www.cousteau.org; Jean-Michel Cousteau, *My Father, the Captain: My Life With Jacques Cousteau* (Washington, DC: National Geographic, 2010), Kindle edition, Loc. 783.

> To swim fishlike, horizontally was the logical method in a medium eight hundred times denser than air . . . At night I had often had visions of flying by extending my arms as wings. Now I flew without wings. . .From this day forward we would swim across miles of country no man had known, free and level, with our flesh feeling what the fish scales know.[193]

It was a transcendent experience -- one that Cousteau wanted to share with the public. In 1943, over a decade prior to his Academy Award-winning film, *The Silent World,* Les Mousquemers produced their first underwater film, *Épaves (Shipwrecks)* using two Aqua-Lung prototypes. Cousteau made the film for two reasons: first, to demonstrate that the film of the exploration of a shipwreck could be "thrilling and entertaining" and second, as a promotional tool for the Aqua-Lung.[194] It worked; by 1960, a million Americans were diving with scuba using the Aqua-Lung.[195] There was no keeping up with the demand.

As a navy man, Cousteau knew that the world's ocean regions held galaxies yet to be explored in order to be understood. As a filmmaker, he knew the potency of a visual story. If he could gain access to the world's oceans and its inhabitants, he would then be able to translate that experience to viewers and invest them in its health and stewardship. It was a simple equation, but a big job that required a big boat -- a specially designed research vessel.

Cousteau began to lease *Calypso* in 1950 in perpetuity for a symbolic one franc a year from Loel Guinness, a wealthy lawyer, businessman, and kin to the founder of

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[193] Jacques Yves Cousteau, *The Silent World. A Story of Undersea Discovery and Adventure* (Washington, DC: National Geographic, 2004), 3.
[194] Matsen, *The Sea King,* 73.
[195] See Cousteau, *The Silent World,* xii; see also Cousteau Society Website, accessed June 4, 2017, https://www.cousteau.org.

Dublin's famed brewery. Guinness shared Cousteau's fascination and curiosity about the sea and felt that a ship dedicated to research would open the ocean to exploration and enable the exploitation of its vast mineral and petroleum resources.[196] He allowed Cousteau to shop for the ship to do the job. Cousteau found *Calypso*, a 66-foot converted minesweeper, from a fisherman who was willing to sell. With Guinness' approval, Cousteau had it refitted it as a mobile laboratory for field research, diving, and filming.

An insatiable curiosity -- to see, to know -- akin to that of Beebe and Carson, drove Cousteau's work. In answering the question of why explore the ocean, Cousteau's reasons mirrored Carson's. "Obviously man has to enter the sea," he wrote. "There is no choice in the matter. The human population is increasing so rapidly and land resources are being depleted at such a rate, that we must take sustenance from the great cornucopia." [197]

Unlike Beebe and Carson, however, Cousteau broke from a wholly oceancentric view and adopted one that more closely aligned with the anthropocentric. "[*The Silent World]* presented these systems as precious, unique, vibrant, and crucial to healthy seas and human existence and framed them of a co-dependent system intricately linked to the health of an ocean world that positioned society as their stewards."[198] Further, *The Silent World* ventured into an arena of filmmaking not yet explored as a genre, that of "participatory filmmaking" whereby the filmmakers become part of the story itself. Cousteau wanted more than to simply take viewers beneath the sea -- he wanted to

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[196] Matsen, *The Sea King*, 108.
[197] Cousteau, *The Silent World*, 160.
[198] John Anderson and Kimberly Peters eds., *Water Worlds: Human Geographies of the Oceans* (London and New York: Routledge Taylor & Francis Group, 2016), 56.

engage them by exposing the process of the movie-making. In the film, Cousteau narrates: "This is a motion-picture studio sixty-five feet under the sea. These divers, wearing compressed-air Aqua-Lungs, are true spacemen, swimming freely as fish."[199]

It is not difficult to draw a robust parallel between Cousteau's exploits and those revealed in Verne's *Twenty Thousand Leagues Under the Sea.* Whether by circumstance or design, Cousteau was indeed Captain Nemo incarnate, the Aqua-Lung, a breathing apparatus similar to that which allowed Nemo and Aronnax to roam the seafloor, and the *Calypso,* a twentieth-century *Nautilus.* In both narratives, it is through technology that the wonders of the sea are explored, revealed -- and mastered. In Cousteau's case, access was granted to this little-seen world via *Calypso*, the Aqua-Lung, and of course, his camera.

Through his films, the sea unfolds as a vast Edenic stage for Cousteau himself to perform along with an array of ocean denizens that take on the role of supporting actors -- and not just any actors, but more specifically, child actors. For example, In *The Silent World*, when following a group of porpoises, he informs the audience that they call to each other “in their little squeaky voices.” In terms of ethical issues surrounding wildlife filmmaking, if today's standard of practice was in effect then, Cousteau would have likely been chastised for his crew's man-handling of wildlife of which is boasted through the pages of *The Silent World,* as well as throughout the film. "We saw three sharks sleeping in rocky caverns," writes Cousteau. "The camera demanded lively sharks. Dumas and Tailliez swam into the caves and pulled their tails to wake them."[200] In the film, one of

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[199] Narration by Jacques Cousteau in *The Silent World* (documentary), directed by Jacques Cousteau and Loius Malle, 1956.
[200] Cousteau, *The Silent World,* 128.

his divers takes hold of the shell of an enormous sea turtle, which bucks under the weight of the diver while Cousteau informs the audience that “A sea turtle ride is a lot of fun, but they don’t steer very well." The ocean becomes an undersea playground to which his audience is invited. In her book, *Watching Wildlife,* Cynthia Chris accurately calls *The Silent World* “less a wildlife film . . . than an adventure undertaken by men living off the sea’s consumable resources."[201] Cousteau explains his mission this way:

> The expeditions of Calypso seek to expand knowledge that would help threatened species. From cages made from Plexiglas we will film life that is serene, savage or beautiful. . . Each time we dive, each time we enter the sea, we learn something new. It is the promise that lures us, and we have never been better equipped to see, learn, to record. This voyage is the culmination of my life's work to explore and unravel the mysteries of the sea.[202]

Like Beebe decades before him, Cousteau's method was not embraced by all; especially some notable marine scientists who took issue with his approach. More than a decade after accompanying Cousteau aboard the *Calypso* in the Indian Ocean and making a cameo appearance in his first episode of *The Undersea World of Jacques Cousteau* titled, "Sharks" (1968), icthyologist, skin diver, and intrepid explorer, Eugenie Clark stated,

> Cousteau's films are misleading in a way because they portray him as a scientist. I can't think of any particular scientific contribution he's made because he just doesn't have the time. . . he needs to keep up that big image, to make it look like he's moving forward. When you get up there,

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[201] Cynthia Chris, *Watching Wildlife* (Minneapolis: University of Minnesota Press, 2006), 42.

[202] Cousteau quoted by Walter Sullivan in "TV: Jacques Cousteau Visits World of Sharks; ABC Begins Series on Oceanic Life, Oceanic Killers are a Drama in Themselves," *New York Times,* January 9, 1968, accessed September 12, 2017, http://query.nytimes.com/gst/abstract.html?res=9C03E2DA1038E134BC4153DFB7668383679EDE&legacy=true.

> when you have all that power, sometimes you lose track of what you started out to do.[203]

Clark, a.k.a. "The Shark Lady" worked her own magic in shifting public opinion of the ocean and its inhabitants as dangerous through her wildly popular book, *Lady with a Spear* (1953). Though indeed a "lady," Dr. Clark shattered stereotypes by domesticating not only a happy home, but the ocean itself. Engaged in the "dangerous" and "masculine" field of ocean exploration and specializing in sharks and poisonous fishes no less, Clark debunked the notion of the ocean as a place to be feared. "It is one of the jobs of a marine biologist to make the environment of the sea more familiar and hence, safer through studying and understanding the animals which live in it."[204]

Clark's failure to recognize Cousteau's work as a contribution to ocean science, when she, herself, had devoted her life's work to trying to reshape the public's negative image of the shark, underpins the divide between many scientists and popularizers. Further, it affirms my assessment of the fundamental lack of understanding by many scientists of the necessity for science storytellers. Though Clark is correct that Cousteau was not a scientist in the traditional sense, her own myopia prevented her from appreciating his role in popularizing science -- the work that Cousteau's work was setting out to do. She was not alone in her critique. Some reviewers of the program echoed sentiments of those who disparaged Beebe's work, calling Cousteau "an oceanic

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[203] Eugenie Clark interviewed by Gordon Chaplin for his article, "Jacques Yves Cousteau," *Washington Post*, January 11, 1981, accessed September 20, 2017, https://www.washingtonpost.com/archive/lifestyle/magazine/1981/01/11/jacques-yves-cousteau/baccfb9e-ad4f-4963-b7db-bc2f326f2d36/?utm_term=.c596ac4c0686.
[204] Eugenie Clark, "Wonders of the Deep, by Eugenie Clark," *Cairo Calling* 847, pt, 2 (June 9, 1951):12-13.

showman [who] contrived to inject a certain amount of drama into the presentation."[205] Cousteau's response was direct: "Our films have only one ambition, to show the truth about Nature and give people the wish to know more," he said. "I do not stand as a scientist giving dry explanations. I am an honest witness."[206] An honest witness, indeed, but perhaps to a constructed reality. "Documentaries are fictions with plots, characters, situations, and events like any other," writes film scholar, Bill Nichols in *Representing Reality*. He continues:

> They offer introductory lacks, challenges or dilemmas; they build heightened tensions and dramatically rising conflicts, and they terminate with resolution and closure. They do all this with reference to a "reality" that is a construct, the product of signifying systems, like the documentary film itself.[207]

Constructed reality notwithstanding, Cousteau's impact on shaping a narrative of the ocean that invested the audience in its conservation could not be underestimated. He was the first to enter people's living rooms and take them under the sea in a way that was not only educational, but *entertaining,* not just expository, but *experiential*. By conveying his observations as the action unfolded (or at lease seemingly so), he created an immediate and intimate connection between the viewer and the sea -- an emotional connection. When danger lurked, the audience felt fearful; when he dispelled myths, the

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[205] Walter Sullivan, "TV: Jacques Cousteau visits World of the Sharks," *The New York Times*, January 9, 1968, accessed September 12, 2017, http://query.nytimes.com/gst/abstract.html?res=9C03E2DA1038E134BC4153DFB7668383679EDE&legacy=true.

[206] Sarah Davidson, "Cousteau Searches for his Whale" *New York Times*, September 10, 1972, accessed September 12, 2017, http://www.nytimes.com/1972/09/10/archives/article-3-no-title-cousteau-searches-for-his-whale-cousteau.html.

[207] Bill Nichols, *Representing Reality: Issues and Concepts in Documentary* (Indiana: Indiana University Press, 1992), 107.

audience felt empowered. The viewer became part of the process -- "in" on the adventure. He was the quintessential storyteller, engaging the viewer in a constant game of surprise and revelation. As Cousteau explored, the audience explored along with him -- aided by his crew and eighteen cameras. After the first program aired, Bosley Crowther from *The New York Times* wrote, "The intimacy with the explorers, intelligently and humorously set up, is largely responsible for the vivid sense of participation one gets from the films. At the end, you, Captain Cousteau, his crew and their dog are friends."[208]

Cousteau had landed the biggest fish: the American public. He had a formula that worked and he did not veer from it. The audience for *The Undersea World* grew steadily over the next three episodes and the series was renewed and went on to air for a decade, winning Emmy awards every season and boasting ten to twelve million viewers per episode.[209] At the time, it was at the top of the charts, far outperforming any other natural history series on television.

Here, we revisit the idea of seeing vs. knowing and the concept of what we construe as reality. It is important to realize that what is real and what is truth often conflict. Nowhere, perhaps is this truer than in the arena of documentary film. In *Representing Reality,* film scholar Bill Nichols states,

> As a machine the camera produces an indexical record of what falls within its visual field. As an anthropomorphic extension of the human sensorium the camera reveals not only the world but its operator's preoccupations, subjectivity, and values. The photographic (and aural) record provides an imprint of its user's ethical, political, and ideological stance as well as an imprint of the visible surface of things.[210]

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[208] Bosley Cowther, as quoted by Matsen in *The Sea King,* 186.
[209] Matsen, *The Sea King,* 191.
[210] Nichols, 79.

The minute we, as filmmakers, turn on the camera and point it in a direction to record an event, we have made an editorial choice that affects and alters the relationship between viewer and subject. The truth of the situation holds within it pure, unadulterated, factual information, but the narrative of that truth is the filmmaker's domain. It is the filmmaker who has the power to craft that narrative through their own lens, not of just the camera, but of their experience, their history, their value system. Nichols argues,

> If a [fictional] narrative invites our engagement with a story, set in an imaginary world, documentary invites our engagement with the construction of an argument, directed toward the historical world. The authenticity of the sounds and images recorded in the historical world . . . constitutes evidence about the world.[211]

There is a fundamental difference, especially in Cousteau's case, between "*the* world" and "*a* world." "The world" is absolute. It exists without historical context. Like fiction filmmakers, documentarians construct "a world" into which we insert our own personal histories. What is unique about Cousteau's work is that before his cameras captured the daily dramas unfolding beneath the waves, few Americans had set their eyes on the "place" of the deep sea. As established earlier in this paper, our lack of familiarity with it had relegated the ocean to an ahistorical space. Up to now, the story of the ocean was one that was *told* to the public, translated by writers and scientists and illustrators and popularizers. Cousteau took a different tack -- he engaged the public in an experiential visual story. For the first time, viewers were led into the act of ocean exploration where Cousteau was not only providing evidence about the world, he was

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[211] Ibid., 118.

indeed *crafting* the evidence to support his view of this world. The shared access he granted to viewers allowed them to come to know it, not as "a world," but as *the only* world they knew beneath the waves. Cousteau bred the construction of an American history with the ocean and thus offered entry into this world.

On July 20, 1969, while two Americans, Buzz Aldrin and Neil Armstrong were making their giant leap for mankind, Cousteau was in Los Angeles adding his own oceancentric postscript to the event, using the image of the earth sent from the Apollo to illustrate the earth as a blue planet.

> Now we can see for ourselves that the earth is a water planet . . . the only known planet to be washed with this vital liquid so necessary for life. The earth photograph can drive a second lesson home for us; it can finally make us recognize that the inhabitants of the earth must depend upon and support each other.[212]

That "blue marble" image of the earth provided a striking new visual context for the earth as an ocean planet. It was impossible to view that image and ignore the ocean's "place." No longer would we have the luxury of ignorance to separate sea from land; on this earth, the ocean was all encompassing. The ocean ruled.

The Undersea World of Jacques Cousteau was just that -- Cousteau's world; his domain, his portrayal of a liquid universe that was foreign to most. He assumed authority over the sea aided by his camera and by carefully choosing which stories would be

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[212] Excerpt from Jacques Cousteau's address at the Oceanography 2000 Conference in 1969. Of the many oceanographic conferences held at the time, this was unique as it was expressly for students. Jointly conducted by the U.S. Naval Institute and the U.S. Naval Academy at Annapolis, Maryland from December 10th through 13th, the gathering brought 575 college students to meet with world famous oceanographers such as Jacques Cousteau and Roger Revelle. Aaccessed October 1, 2017, https://www.motherearthnews.com/nature-and-environment/jacques-cousteau-zmaz70sozgoe.

filtered through his lens, he constructed a reality that would be transferred to the viewer and for them become truth. And the reality was this: the ocean, a place full of life, beauty, and importance is a threatened ecosystem. Moreover, we as humans are intricately tied to its fate.

In 1971, in a testimony before the United States Senate to gauge the importance to creating a governmental agency that would become the ocean equivalent of NASA, Cousteau stated sharply, "The oceans are dying." He continued, "We are facing the destruction of the ocean by pollution and by other causes."[213] He went on to dispel the concept that the immensity of the ocean is such that no human could have an impact upon it, and called for industrialized nations to exorcise the idea of "the endless riches of the sea." And with that, Cousteau accepted the baton passed from Carson and rewrote the narrative of America's relationship with the sea. Embedded in that narrative was the confluence of environmentalism and technology. The *Calypso* was not only a vessel to move Cousteau and his film crew across the ocean to capture its immense diversity, it had become an instrument used by Cousteau to take the pulse of the ocean and gauge its health.

In 1973, the Cousteau Society was formed as a non-profit organization and within a year boasted 120,000 members who had each contributed an average of twenty dollars to become members.[214] It was markedly different than other environmental nonprofits of

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[213] Cousteau's pronouncement of the dying ocean is from an interview published in "Environment: The Dying Ocean" *Time Magazine,* Monday September 28, 1970, accessed October 1, 2017, http://content.time.com/time/magazine/article/0,9171,909651,00.html.

[214] See Matsen, 195.

the day, such as the likes of Greenpeace, The Sea Shepherd Society and the Sierra Club. Whereas most environmental organization focused on single-issue campaigns, such as "Save the Whales," The Cousteau Society put resources into what Cousteau did best -- communication. "We are communicators," wrote Cousteau in the Society's first press release, "using words and pictures to educate living and future generations about our biological home." Today, the Society stays true to its original mission of communication, stating,

> Only an informed and educated public can make the decisions necessary to protect and manage the world's natural resources . . . The Society speaks in testimony and counsel to governing bodies and leaders on issues of global concern, such as the protection of whales, fisheries, coral reefs and other habitats. [215]

The decade over which the thirty-six episodes of *The Undersea World* aired not only shifted the way millions of people came to know the sea, but also shifted the way Cousteau himself saw it. He still saw value in his role as a charismatic entertainer, but he also found new purpose in his mission, to engage people in the protection of our fragile ocean. It was time to ignite a movement that would motivate the masses, influence policy, and move the needle. But would he succeed?

Cousteau understood that awareness itself could only do so much. In 1976, the Society began holding nation-wide "involvement days."[216] These were designed to

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[215] See the Cousteau Society website: https://www.cousteau.org; see also "Jacques Cousteau and The Cousteau Society," *Planet Shifter*, accessed October 1, 2017, http://www.planetshifter.com/myth/ 127/captain-jacque

[216] A variety of organizations from across the United States celebrated Cousteau's "Involvement Days." See for example the following article, all accessed on October 11, 2017, "Jacques Cousteau Confers with Barrow Whalers, Plans Joint Arctic Expedition with Inuit," Arctic Coastal Zone Management Program, Barrow, AK, October 1977,

transfer the public's understanding of the issues of the ocean to active engagement through a mass effort dedicated to education and political action. The goal was to urge the Unites States to support the idea of the ocean as a common responsibility for all nations. Though Public Understanding of Science (PUS) as an established field was still a decade away, Cousteau had made understanding and engagement in ocean science his primary aim. As he led the charge, ocean activism was on the rise. Children and adults across America were suddenly sporting little red caps and talking about saving whales. The public began pushing governments and corporations to practice sound ocean management, create conservation policy, and enforce existing laws through effective regulation.

By 1976 and after a ten-year run of *The Undersea World,* the audience's palate shifted and Cousteau's concern about the state of the environment intensified. He, along with his son Philippe, pitched a six-part series to PBS called *Oasis in Space* that would take a sobering look at topics including population explosion, hunger, chemical waste, the dangers of nuclear power plants, and the pollution of the oceans. PBS picked it up, but Cousteau was tasked with raising the funds for it and had immense trouble finding sponsors. Those who heartily supported *The Undersea World* were far less enamored

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http://www.ebenhopson.com/czm/1977cz/oct1977 /october.htm; see also News-Press from For Meyers, Thursday April 1, 1976, page 45, https://www.newspapers.com/newspage/212242606/; see also San Francisco Unified School District Newsletter, Volume 48, no. 8, January 10, 1977, https://archive.org/stream/sanfrancisc4748197577sanf/sanfrancisc4748197577sanf_djvu.txt; see also see also "Cousteau," *The Palm Beach Post,* West Palm Beach, Florida, July 8, 1979, Page 49, https://www.newspapers.com/newspage/134923762/

with the proposal of a series that would expose grim truths about environmental disasters. Executives felt the series would brand corporations as insensitive exploiters of a fragile planet. What's more, they also concurred that not many people would flock to their televisions to watch such a grim show.[217] They had a point. The style of *Oasis in Space* was a far cry from that of the cheerful *Undersea World* series. The first episode "What Price Progress?" revealed explicit footage of badly deformed victims of mercury poisoning. Though that first episode won an Emmy, the series quickly lost viewers and was not renewed.

This setback did not deter Cousteau from his course, it only caused him to pause long enough to take a running start from a different angle. After all, he was by this time a brand in America and had the social currency to reshape the country's sense of stewardship. Though he was treasured throughout the world, he was an environmental giant in the United States. "Only in America was the environmental movement shaking governments, writes Matsen. "Only in America did people seem willing to contribute millions of dollars to make this happen."[218] Cousteau understood the value of celebrity status (whether his own of that of others) to fundraising and put that status to work. He used the resources of the Society and his networks and brought in the funds to hold "involvement days" with a host of environmental luminaries, actors, songwriters, and other heavyweights at sports arenas across the country. It elevated the cause to rock-star

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[217] See Matsen, The Sea King, 196-197.
[218] Ibid., 198

status rallying crowds upwards of 15,000.[219] It opened up an entirely new pool of supporters and potential sponsors. The hitch is that waves are dependent on tides. And the thing about tides is that, well, they shift.

One unlikely cohort to Cousteau's mission was Richard Anderson, the chairman of Atlantic Richfield Petroleum Company (ARCO), who wrote a six-million dollar check to commission a twelve-part series for PBS called the *Jacques Cousteau Odyssey* that would feature Cousteau and his son Philippe. To some Cousteau supporters, an alliance with Anderson was akin to making a deal with the devil, and the details were not lost on Cousteau, but he had no qualms about accepting the check. For Cousteau, it made perfect sense to approach an oil business billionaire who had profited from the extraction of the world's resources and solicit funds for the series. In Cousteau's eyes, companies like ARCO had a duty to ensure their work was not having a calamitous impact on the environment and a deal like this held them accountable for their role.

The agreement was the series would to be a return to exploration and adventure aboard the *Calypso* and leave the doom and gloom behind. Though Anderson vowed to stay out of the way of production and did not have any editorial control over the project the first two episodes, titled, "Cradle or Coffin" and "Time Bomb at Fifty Fathoms" tested him as they pointedly highlighted the human threat to the oceans. Despite Anderson's woes, "Time Bomb" was Cousteau's greatest critical success in a decade, "a powerful entertaining statement of what he wanted for the Cousteau Society to tell the

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[219] Ibid., 198; see also Caryle Murphy, "Cousteau Center Divides Norfolk," *The Washington Post,* July 6, 1985, accessed October 1, 2017, https://www.washingtonpost.com/archive/local/1985/07/06/cousteau-center-divides-norfolk/d367b6bf-d706-44ab-a258-a008efefa4ed/?utm_term=.4e962c8703b1.

world: the oceans are in trouble, but we humans are not helpless to save them."[220] With every episode of the series, PBS saw their ratings spike. Americans were riding a wave of ocean conservation.

The rest of the *Odyssey* series lightened in tone, but still incorporated the Cousteau signature anthropocentrism, whether featuring the subject matter of shipwrecks, the lost city of Atlantis (which timed well with pop-culture of the late 1970s, as songs about the lost continent were scaling the *Billboard* charts), or "exotic" travelogues of locations such as Easter Island and the Nile River. In the latter, Ted Strauss, the show's writer, put a fine point on Cousteau's thesis that human beings were altering the nature of the river: "Not only are ancient cultures and animal sanctuaries being threatened by extinction, but men are learning that technological triumphs sometimes create problems greater than the ones they seek to solve."[221] What no one could have known at the time of Strauss' delivery, was that it would turn out to be a prescient piece of prose. On the afternoon of June 28, 1979, as Philippe was piloting *Flying Calypso,* the amphibious plane that was featured in the Nile programs on a short test flight out of Lisbon, the plane plunged into the waters of the Tagus River and Philippe was killed.

Cousteau's grief ran deep. Philippe was not only his son, but his business partner, co-host, and best friend. There were still three films to edit in the series and the Foundation was spiraling towards bankruptcy. It was at this time that Jean-Michel, Cousteau's oldest son, stepped up to support his father, the series, and the Foundation.

Despite all the hardship, Cousteau, in his early seventies, remained steadfast in his

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[220] Matsen, *The Sea King,* 207.
[221] Narration from Cousteau's film, *The Cousteau Odyssey: The Nile,* 1979.

vision. He wanted to develop another series, this time on the Amazon. He goal was to draw attention to the great rivers of the world as life-support systems of the oceans that were now being polluted. With more than three-quarters of the earth's population living within ten miles of a coast or major river, people needed to understand the connection between rivers and the ocean in order to avert disaster. It was a worthy mission but it was now the early 1980s and The Cousteau Foundation lacked the funds to realize it. Worse, it was a difficult series to sell to mainstream network as they were seeing a shift in their demographic as they gravitated towards lighter fare sitcoms such as *Cheers* and *The Cosby Show* and dramatic series such as *Dallas.* Cousteau's films failed to rate in the top 50 shows of the '80s (see figure 18).

Top 50 Television Shows of the 1980s

1. 60 Minutes	26. Dukes of Hazzard
2. Dallas	27. Matlock
3. The Cosby Show	28. One Day at a Time
4. Cheers	29. L.A. Law
5. Murder, She Wrote	30. Alice
6. The Golden Girls	31. The Wonder Years
7. Monday Night Football	32. Hotel
8. Dynasty	33. Empty Nest
9. Who's The Boss?	34. CBS Sunday Movie
10. Family Ties	35. ABC Monday Movie
11. Magnum, P.I.	36. Moonlighting
12. Falcon Crest	37. Archie Bunker's Place
13. A Different World	38. Too Close for Comfort
14. The Jeffersons	39. ALF
15. Night Court	40. Trapper John, MD
16. Growing Pains	41. Amen
17. M*A*S*H	42. Unsolved Mysteries
18. Three's Company	43. The Fall Guy
19. The Love Boat	44. NBC Monday Movie
20. Simon & Simon	45. Dear John
21. The A-Team	46. ABC Sunday Movie
22. Newhart	47. Hart to Hart
23. Roseanne	48. In the Heat of the Night
24. Knots Landing	49. Highway to Heaven
25. Kate & Allie	50. House Calls

Figure 18. *Top 50 Television Programs of the 1980s. Source:* 1980 - 1989 A.C. Nielsen ratings results.[222]

Jean-Michel called an emergency meeting of advisors, which included songwriter, John Denver, to seek a strategic way forward. Denver suggested to 71-year-old Cousteau that he meet another cultural icon whose passions lay in sailing, conservation, and revolutionizing the way Americans consumed media through the emerging platform of cable television: Ted Turner. As a yachtsman, winner of the 1977 America's Cup, and

[222] See the official Neilsen website, accessed June 1, 2017, http://sites.nielsen.com/90years/; see also Bob Batchelor and Scott Stoddart, *The 1980s: American Popular Culture through History*, (Santa Barbara: Greenwood Publishing Group, 2006) 110.

cable television pioneer, Turner carried a reputation for being brash, impulsive, and outspoken. After creating his superstation, WTBS in 1978, Mr. Turner was fast becoming a media mogul, breaking new ground in 1980 with Cable News Network (CNN), a 24-hour all-news cable channel and its spin-off, CNN Headline News. Upon meeting Cousteau, the two became fast friends. Turner had great respect for Cousteau's achievements and respected his work as a popularizer. He believed that a single person like Cousteau who could deliver important, yet entertaining messages to the world was far more essential than a thousand scientists who made sense only to one another.[223]

Turner was also hungry for content. Upon hearing about the idea of a six-month voyage down the Amazon on the *Calypso* to produce a series of four one-hour episodes, Turner asked what Cousteau would need to make the series happen. Cousteau responded that it would take six-million dollars. "You've got it," replied Turner, sealing the deal.[224]

Cable television is an entirely different animal than commercial broadcast television. As a subscription- and syndication-based model, it was free from the shackles of Neilsen ratings. For Turner, who was the kingpin of cable television at the time, it didn't matter if Cousteau's Amazon series lost money as Turner Broadcasting System Inc. was turning a profit; TBS alone was taking in about half of the entire cable industry's advertising revenues, according to a report in *The New York Times.*[225] To Turner, it was the message that mattered. His goal was to keep Cousteau's mission in the line of sight of

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[223] Matsen, *The Sea King,* 226.
[224] Ibid., 227; see also Sandra Salmans, "Television's 'Bad Boy' Makes Good," *New York Times*, August 14, 1983, accessed April 29, 2017, http://www.nytimes.com/1983/08/14/business/television-s-bad-boy-makes-good.html?pagewanted=all.
[225] Salmans, "Television's 'Bad Boy' Makes Good."

the American public. In the *Times* article Turner stated, "Someone had to keep Cousteau going, and it's a prestige thing to do, like a loss leader in the supermarket."

Thrilled with the footage Cousteau brought back, Turner remained committed. When Cousteau later approached Turner to do a two-part series about the Mississippi, Turner wrote another check, and after that series, another. Turner continued to finance Cousteau's work until 1992, despite thinning viewership due to an expanding broadcast market. Although Cousteau's films continued to attract audiences into the last decade of the century and of his life, "they no longer startled viewers into seeing the world anew," writes Gerald Jonas of *The New York Times*. "The man who had helped to create the nature documentary as a distinct genre, now had to contend with the myriad of competitors his success had spawned."[226] The sharp environmental messages that Cousteau carried to Americans, unencumbered by peer review, cut through. "What Jacques Cousteau said on television was important to the world," writes Matsen, "mostly because it was Jacques Cousteau saying it, and the truth was that the oversimplifications and generalities were about as much as the average American could handle about ecology."[227]

Cousteau, through his television programs, had not only inspired, but engaged audiences in the protection of the ocean and led and entire generation of young scientists to become oceanographers. According to John C. Mutter, director of the Lamont-

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[226] Gerald Jonas, "Jacques Cousteau, Oceans' Impresario, Dies," *The New Yorks Times,* June 26, 1997, accessed May 1, 2017, http://www.nytimes.com/1997/06/26/world/jacques-cousteau-oceans-impresario-dies.html.
[227] Matsen, *The Sea King,* 231-232.

Doherty Earth Observatory at Columbia University, Cousteau would be remembered not so much for his research, but as "a popularizer of genius, who set firmly in the public mind the fundamental importance of the world's oceans to the fate of the planet."[228] Perhaps the best way of encapsulating Cousteau's legacy was through the words of his son, Jean Michel upon his father's death in 1997: "The work of my father was a hymn to life."[229] Cousteau indeed did not only know the work he wanted his work to do, he used it to create a refrain.

More than Meets the Eye

Through the pages of this chapter, I set out to place my finger on the pulse of twentieth-century America's emerging relationship with the ocean via the work of William Beebe, Rachel Carson, and Jacques Cousteau and have, up to this point, lauded their contributions. In the context of the intellectual, cultural, and political shifts of the century, I have illustrated how their roles in popularizing ocean science contributed to a pattern of increased awareness and engagement by the "American public" in ocean stewardship. Though they each employed a unique approach that stemmed from an intensely personal connection to the sea, they were bound by a greater oceancentric philosophy that recognized the ocean as the dominant force of life on earth.

Steadily throughout the twentieth century, investment in the ocean grew, due in great part to the contributions of these luminaries. No longer viewed as simply a barrier or connector, destination or resource -- something outside many Americans' immediate

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[228] Ibid.
[229] As quoted in Jonas, "Jacques Cousteau, Oceans' Impresario, Dies."

experience -- the ocean was revealed by Beebe, Carson and Cousteau as a living ecosystem on which all humans depended for survival and for which we had a responsibility to protect. These three popularizers went far beyond merely expanding ocean literacy; countless scientists had attempted to share information about the sea in order to educate the public. The difference, I posit, is that Beebe, Carson and Cousteau, despite criticism from those seemingly in their own camps, packaged the science in storytelling that was compelling, emotional, and visual; in other words, entertaining. From the animated descriptions of Beebe, to the poetic prose of Carson, to the dynamic films of Cousteau, each constructed a narrative of the ocean that incorporated all the elements of creative storytelling: plot points, character development, tension and drama, and most importantly, a visual hook which brought the public to see for themselves both the exquisite beauty the ocean held and the horrors being waged against it due to human impact. Their work signaled a call to action. At long last, a large contingent of the American public began to forge a relationship with the ocean in which they could play an active role. And for the first time, the public had become part of the ocean's narrative -- a select portion of the public, that is. And this is where their work fell short.

For all the good Beebe, Carson and Cousteau did in terms of raising awareness at the time, when we look at the long-term impact of their work, we find the needle hadn't moved all that much. We still did not have a national ocean policy. Ocean pollution and overfishing were on the rise, globally. Perhaps the limitations to their work may have stemmed from the diffusionist approach to science communication to which all three subscribed. Based on the deficit model of science communication, embedded in this

theory is the idea that the lay person is an "empty bucket" when it comes to understanding science, but when "filled" with scientific information from the experts, they become empowered to act. [230] This model has since been challenged and shown to have limited, and in some cases a reverse effect.[231] Further, the story of the ocean they were sharing with the "American public" was not truly inclusive of all Americans; it was in fact targeted to a particular audience -- predominantly a white, middle-class, upwardly-mobile, audience.[232] Those who were being directly impacted by ocean-environmental issues, namely Indigenous people, were not part of the dialogue except when exploited as subject matter. None of this is to discount the tremendous value their work had; Beebe, Carson and Cousteau were effective in seeding the oceanic movement. People were getting involved -- and feeling good about getting involved. But in the grand scheme of things, the lasting impact of their work was limited in scope.

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[230] For more on the "deficit model" of science communication, see Patrick Sturgis and Nick Allum, "Science in Society: Re-evaluating the Deficit Model of Public Attitudes," *Public Understanding of Science* 13, no. 1 (2004): 55-74; see also Tania Bubela, Matthew C. Nisbet, Rick Borchelt, Fern Brunger, Cristine Critchley, Edna Einsiedel, Gail Geller, et al, "Science Communication Reconsidered," *Nature Biotechnology* 27, no. 6 (2009): 514-518; see also Massimiano Bucchi, "Of Deficits, Deviations and Dialogues: Theories of Public Communication of Science," *Handbook of Public Communication of Science and Technology* (2008): 57-76

[231] See Bucchi, "When Scientists Turn to the Public: Alternative Routes in Science Communication," *Public Understanding of Science* 5, no. 4 (October, 1996): 375-394; see also Matthew C. Nisbet and Dietram A. Scheufele. "What's Next for Science Communication? Promising Directions and Lingering Distractions," *American Journal of Botany* 96, no. 10 (2009): 1767-1778.

[232] Miriam Goldstein, "A Field Guide to Privilege in Marine Science: Some Reasons Why We Lack Diversity," *Deep Sea News,* January 24, 2013, accessed November 22, 2017, http://www.deepseanews.com/2013/01/a-field-guide-to-privilege-in-marine-science-some-reasons-why-we-lack-diversity/; see also Laurie Ouellette, *Viewers Like You: How Public TV Failed the People* (New York: Columbia University Press, 2002); see also Jennifer A. Kokai, *Swim Pretty: Aquatic Spectacles and the Performance of Race, Gender, and Nature* (Carbondale: Southern Illinois University Press, 2017).

If we are to accept Rozwadowski's argument that we can only come to know something by sharing a history with it, then surely the twentieth century marked the beginning of a significant turn in shaping *some* Americans' relationship with the sea. Up until then, the public had been kept out of the story of the ocean. Beebe, Carson and Cousteau invited their audience in. But, if a game changer is truly what we are after in terms of ocean conservation, then I contend we must be more inclusive of *all* histories and invite diverse ways of knowing the ocean so that we can permit our own individual relationship with the sea to expand, transcend the imagined, become active and thus, real.

CHAPTER THREE

REDEFINING NARRATIVE OWNERSHIP OF THE OCEAN

We live in a scientific age: yet by a strange paradox we behave as though the knowledge of science is the prerogative of a small number of men, isolated and priestlike in their laboratories. This is not true. It cannot be true. The materials of science are the materials of life itself. Science is the what, the how, and the why of everything in our experience. It's part of the reality of living. (Rachel Carson)[233]

Through these pages, I have so far explored how the Western relationship with the ocean has been shaped, and reshaped, over time. From a space imagined through myth and metaphor, to a place displayed through art and science, to a narrative that we could write ourselves into as active participants, our history with the ocean has been informed by these myriad "ways of seeing." Some transitioned from passive consumer of its story to active agent within it, while others were either left out of the narrative altogether or claimed an entirely different narrative.

In this chapter, I will examine the concept of "narrative ownership" and how it has manifested as a double-edged sword with regard to the ocean.[234] Filmmakers commonly use this term to assert authorship over "their" story. Narrative ownership of a

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[233] Rachel Carson, Acceptance Speech for *The Sea Around Us*.

[234] For scholarship on narrative ownership see William E. Smythe & Maureen J. Murray "Owning the Story: Ethical Considerations in Narrative Research," *Ethics & Behavior* 10, no. 4, (January 8, 2010): 311-336, accessed October 3, 2017, http://www.tandfonline.com/doi/abs/10.1207/S15327019EB1004_1?journalCode=hebh0; see also Amy Shuman, "Story Ownership and Entitlement," *The Handbook of Narrative Analysis,* Ana De Fina and Alexandra Georgakopoulou, eds. (Hoboken, NJ: John Wiley & Sons, Inc., 2015), accessed October 2, 2017, http://onlinelibrary.wiley.com/doi/10.1002/9781118458204.ch2/summary.

story grants the architect the liberty to construct, destroy and reconfigure the narrative to suit the storyteller's objective. I will argue that this presents an especially complex problem in terms of twenty-first century science communication. We now reside in an era where the digital media landscape is rapidly expanding and the public is barraged with information, much of it conflicting. It is now possible for anyone with an opinion to insert him or herself into a narrative and claim "ownership." This has led to a detrimental distrust of both science and the media in the eyes of the public. Not only that, but the term "ownership" may also connote "appropriation." Too often have even the most well-intentioned filmmakers entered a community to tell other people's stories, usually those in a vulnerable position, and left without ever giving community members an opportunity to share their own perspective. This can be damaging to capacity building as it may leave people they are trying to "help" feeling used and further disenfranchised. To combat this, I propose that environmental storytellers rethink the concept of narrative ownership and move towards a more collective approach that remains true to factual and evidence-based scientific information while embracing inclusivity and allowing the subjects of the story to participate in the narrative.

Both marine scientists and media makers have struggled to bring ocean science into public discourse with varied results. In order to examine this, I will begin with a discussion of ocean exploration, encapsulating the work of Dr. Sylvia Earle and pairing it with the philosophic questioning of exploration by science historian Gary Kroll. My goal is to use their positions to assess the impact of a "frontier mentality" on our current relationship with the ocean. Though Earle insists that we have a duty to explore, Kroll

asserts the ocean's plight can be linked to the way westerners conceived of the sea as a frontier space, destined to be explored, tamed, conquered -- and owned.[235] He argues the "terrestrial logic" that ruled westward expansion of the late nineteenth and early twentieth-centuries, led to a "*Manifest Destiny* of the sea," shaping the way many Americans have since related to it. I will couch Kroll's thesis in terms of the digital media landscape we currently find ourselves traversing, and claim that we are in the midst of a "*Manifest Destiny* of Science," if you will, which is impacting our environmental policies.

To this end, I will attempt to assess the current state of science communication and its fusion with the social sciences and argue that only when scientists themselves embrace the power of a collective narrative, will we be able to effect change and influence policy. I will cast a light on the work of scientists such as Dawn Wright and Charlie Veron who are blurring the lines between marine scientist and ocean advocate in order to convey a scientific message that resonates with the public.

Finally, this chapter highlights the results of a survey I conducted to gauge scientists' current use of visual and social media. Building on the work of Dr. Daniel Kahan, a social scientist who has been exploring the science of science communication, I underscore the necessity for visual media as it relates specifically to ocean science messaging. Drawing all of this together, I lay the groundwork for my call to a "collective narrative" that lies at the heart of my motivation for establishing the Ocean Media Institute, which I will examine in the final chapter.

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[235] See Kroll, *America's Ocean Wilderness*.

Earle and Kroll: Exploration of Frontier Ocean

Though there can never be another Jacques Cousteau, simply because we can never "re-discover" the world he constructed for us, many have built on the foundation of his legacy. Sylvia Earle, dubbed "Her Deepness," is perhaps the most notable ocean explorer, marine scientist, and ocean science popularizer alive today, picking up where Cousteau left off in terms of exploration and oceancentric messaging. Spending over 7,000 hours underwater, she is the former Chief Scientist for NOAA, a National Geographic Explorer, runs a non-profit called Mission Blue with a documentary of the same name, and has over seventy-thousand followers on Facebook.[236] In her book, *The World is Blue: How Our Fate and the Ocean's Are One,* she lays out in sobering detail how the past fifty years of neglect of the ocean poses critical threats to the very existence of life on Earth if immediate action is not taken to reverse some of the damage. Infusing science into every argument she makes, her message of a dying ocean runs parallel to Cousteau's, yet she always leaves audiences with a sense of hope rather than despair, focusing on solutions and models of success for its protection.

[236] Much of the information regarding Dr. Earle's work draws from numerous personal conversations I have had with her over the past 6 years. See also Sylvia Earle, *The World is Blue: How Our Fate and the Ocean's are One* (Washington DC: National Geographic, 2009); Wallace White, "Her Deepness," *The New Yorker*, July 3, 1989, accessed October 2, 2017, https://www.newyorker.com/magazine/1989/07/03/deepness; Sylvia Earle, TED Talk, 2009, accessed October 2, 2017, https://www.ted.com/speakers/sylvia_earle; Earle's non-profit organization, Mission Blue, accessed October 2, 2017, https://www.mission-blue.org/earle National Marine Sanctuary Foundation, accessed October 2, 2017, https://www.marinesanctuary.org/member/dr-sylvia-earle/; Mission Blue (documentary, 2014) https://www.mission-blue.org/the-film.

As the sea functions as the primary battery for the planet's climate, generates hundreds of millions of jobs, and produces food for billions of people, there is much hinging on its health. And the only way to restore a sense of balance, Earle claims, echoing Cousteau, is to start with an enlightened public. Earle has done her part to educate, from her own through her books, and speaking engagements, and movies, including her own documentaries, Mission Blue (2014) and *Sea Of Hope* (2017) as well the feature documentary that I worked on, *Our Blue Canoe*. But she is more than just a talking head; in Earle's view, to become truly enlightened about the ocean, one needs to physically engage with that space. She has launched the "No Child Left Dry" initiative, which seeks to introduce kids to ocean, rivers, and lakes wherever they live.[237] Earle is also a staunch advocate of democratizing exploration through the development of consumer undersea vehicles, which she hopes will one day open the ocean to more private recreational exploration.[238] She asserts that in recent decades we have learned more about the ocean than in all previous human history combined and hails the explorers who have contributed to our knowledge of life in the ocean. That being said, she feels we are behind in terms of our understanding of the ocean in comparison to that of "other worlds." She writes,

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[237] For more on "No Child Left Dry," see Kimball Livingston, "No Child Left Dry, *Sailfeed,* August 15, 2014, accessed October 2, 2017, https://www.sailfeed.com/2014/08/no-child-left-dry/ the documentary; see also the documentary, *Sea of Hope,* directed by Robert Nixon, 2017.

[238] In the 1980s, Earle turned her attention to the construction of undersea vehicles with her husband Graham Hawkes, who was an engineer and submersible designer. In the '90's she founded DOER Marine (Deep Ocean Exploration and Research), a robotics company that constructs ROVs and other ocean exploration equipment. She also expressed her hope for public ocean exploration in a discussion with me on August 7, 2014. See also http://www.doermarine.com (accessed October 2, 2017).

> Ignorance about the ocean and lack of understanding about the relevance of the fundamental ways people everywhere are connected to the sea underlie the indifference and complacency that have led to abuses imposed by people in recent years, with dire consequences for our future. In the 20th century, tremendous investments were made in aviation and space technologies that gave humankind ready access to the skies above and advanced knowledge of the heavens beyond. These investments have paid off mightily. Meanwhile, we have neglected the ocean -- and it has cost us dearly.[239]

From what place does this ignorance stem? To answer this, I once again return to the utility of story. There has been a fundamental difference in ways the stories of space exploration have been told as opposed to those of ocean exploration. When Neil Armstrong delivered the words, "That's one small step for a man, one giant leap for mankind," he did three critical things. First, in speaking directly to the American public from the moon, he established himself as both celebrity and relatable character that an audience could invest in. He was indeed a scientist, but also an individual and fellow citizen. Secondly, he created an emotional connection to the landing, drawn from a sense of immense national pride. Finally, his words involved the American public in the narrative of space exploration. From that point on, Americans had a cohesive sense of participation in the story of space exploration. We counted down together when launching space shuttles and grieved together when disaster struck as in the case of the *Challenger* Disaster of 1986, which killed all seven crew-members including a civilian

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[239] Earle, *The World is Blue,* 186.

school teacher, Christa McAuliffe.[240] People remember her name because she was "one of us."

Despite the efforts of Walsh and Piccard, Beebe and Cousteau, deep ocean exploration never presented its story to the American public in quite the same way. Though, as I have established, we engaged in the ocean narrative in the twentieth century as individuals, that narrative was never couched in a sense of community. We don't collectively celebrate the launching of a deep sea rover or weep when catastrophe strikes, as I will explore further in the next chapter. This concept of a "collective narrative " is something I am attempting to infuse into my work with Ocean Media Institute.

There is no doubt the quest to uncover new knowledge about the ocean is a noble pursuit, but there are some who are critical of the narrative of twentieth-century explorers. In the very last line of *America's Ocean Wilderness*, science historian Gary Kroll adds a post-script to Lord Byron's quote, writing, "'Man marks the earth with ruin,' but his ruin didn't stop at the shore. He just looked to another horizon to find another new frontier."[241] Throughout his book, Kroll critically examines the legacies of seven marine explorers and environmentalists including Jacques Cousteau, William Beebe, Rachel Carson, Eugenie Clark, Robert Cushman Murphy, Thor Heyerdahl, and Roy Chapman Andrews. He argues that for all the good these ocean explorers did to raise awareness about the ocean and its plight, they were unable to transcend the culture to

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[240] Clinton Parks, "NASA Remembers three Great Tragedies," SPACE.com, January 27, 2008, accessed June 11, 2017, https://www.space.com/4879-nasa-remembers-space-tragedies.html.
[241] Kroll, *America's Ocean Wilderness,* 194.

which they belonged -- a culture firmly rooted in terra firma.[242] In Kroll's view, the twentieth-century American imagination located the ocean in the realm of frontier and the legacy of conquest that defines America had been transferred to a "*Manifest Destiny*" of the sea. He makes a solid case for the way in which a terrestrial logic that has been applied to ocean has shaped the way many people have related to it ever since – for better and for worse.

Kroll argues that many of the sea's environmental problems can be linked to the way humans conceived of the ocean as a frontier space. Today, with acidic waters, depleted fisheries, and dying coral reefs, the sea itself has become an endangered species, threatened by the same kinds of forces that ravaged the terrestrial wilderness. There is a fine line between *exploration* and *exploitation.* "Herein is the problem," writes Kroll, "in our zeal to transform the ocean into a wilderness frontier, we rarely wondered whether we should be engaged in the project in the first place"[243] That deep-seated

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[242] Kroll, 193; The "Frontier Thesis" that Kroll draws from was initially advanced by historian Frederic Jackson Turner in his 1893 seminal essay, "The Significance of the Frontier in American History" stated that American democracy was formed by the American frontier and frontier land was free for the taking. Since, the "frontier mentality" has become a well-explored topic. In addition to Kroll, see for example, Alex Kirby, "US 'Has Frontier Mentality' On Oceans," *BBC News,* June 4, 2003, accessed October 2, 2017, http://news.bbc.co.uk/2/hi/science/nature/2958870.stm; Lawrence Davidson, "America's Frontier Mentality," *Consortium News*, December 26, 2012, accessed October 2, 2017, https://consortiumnews.com/2012/12/26/americas-frontier-mentality/; Ray Allen Billington, "How the Frontier Shaped the American Character," *American Heritage, The Magazine of History*, IX (April 1958), 4, 7-9, 86-89, accessed October 2, 2017, http://spot.colorado.edu/~mcguire/billington.htm;
Hyakudai Sakamoto, "Towards a New 'Global Bioethics'," *Bioethics* 13 (1999): 191–197; Almo Farina, A.R. Johnson, S.J. Turner, A. Belgrano,
"'Full' World Versus 'Empty' World Paradigm at the Time of Globalisation," Ecological Economics 45, no. 1 (April 2003): 11-18.

[243] Kroll, *America's Ocean Wilderness*, 194.

pioneering spirit, “to control and conquer” is after all, a call that we as humans are loathe to resist. At the heart of Kroll’s thesis is the question: what if we chose *not* to explore?

Dr. Earle insists that twentieth century scientists had a *duty* to explore the ocean. “With a long list of unanswered questions," she writes, "– ‘How deep is the sea? What is it like on the ocean floor? Is there life at great depths?’ – the scientists had a simple but comprehensive mandate: literally, to boldly go where none had gone before.”[244] Yet she acknowledges that with science comes responsibility. She, like Kroll, refers to the famed Byron quote in her book, commenting that that she finds it odd that Byron, or anyone two centuries ago, should think that humans lacked the capacity to impact the ocean, or that anything extracted from natural systems comes without cost.

Both Earle and Kroll call to mind environmental historian William Cronon’s piece, "*The Trouble With Wilderness, or, Getting Back to the Wrong Nature,*" but for different reasons. Cronon discusses the fetishism of wild places and argues, “In the broadest sense, wilderness teaches us to ask whether the Other must always bend to our will, and, if not, under what circumstances it should be allowed to flourish without our intervention."[245] Kroll believes that exploration has become fetishized and that we have romanticized the human construct of “ocean wilderness” to such a degree, that we have created a culture of conquest. Earle, on the other hand, believes exploration is necessary to understand the ocean as a system, so that we can fully appreciate our impact upon it, *instead* of fetishize it. She writes, "Knowledge that humankind does have the capacity to

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[244] Earle, *The World is Blue,* 126.
[245] William Cronon, "*The Trouble With Wilderness, or, Getting Back to the Wrong Nature,*" *Uncommon Ground: Rethinking the Human Place in Nature* (New York: W. W. Norton & Co., 1995), 70.

alter the nature of the sea may be the most important discovery made so far about the ocean."[246] Though they appear to contradict each other, they are both correct. And it's within that sphere of contradiction and concession that the work I do finds its purpose.

I have introduced Earle's and Kroll's theses in this chapter in order to prime my argument for how a frontier mentality translates to the problematic state of science communication today. The western digital landscape we now occupy is in itself, a *"mare incognitum"* through which we seem to be clumsily navigating. The democratization of media in America has provided access to virtually everyone to participate in virtually every issue. This has allowed for an emergence of "self-celebrity" whereby one is free to call him or herself an expert and create a following, no matter who they are or what their experience.[247] In terms of science communication, and more specifically the communication of ocean science, this may have beneficial or detrimental effects depending on the source of the information and experience of the storyteller. We have seen the results of this manifest in terms of America's own ocean policies, which have been excruciatingly difficult to attain.

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[246] Earle, *The World is Blue,* 201.

[247] For scholarship on the concept of celebrity and media, see P. David Marshall, "The Promotion and Presentation of the Self: Celebrity as Marker of Presentational Media," *Celebrity Studies,* Vol. 1, no. 1 (March 17, 2010): 35-48, accessed October 20, 2017, http://www.tandfonline.com/doi/full/10.1080/19392390903519057?scroll=top&needAccess=true; Graeme Turner, "Approaching Celebrity Studies," *Celebrity Studies* 1, no. 1 (March 17, 2010): 11-20, accessed October 20, 2017, http://www.tandfonline.com/doi/full/10.1080/19392390903519024?scroll=top&needAccess=true; Nunn, Heather and Anita Biressi. "'A Trust Betrayed': Celebrity and the Work of Emotion," *Celebrity Studies* 1, no. 4 (March 17, 2010): 49-64, accessed October 2, 2017, http://www.tandfonline.com/doi/full/10.1080/19392390903519065?src=recsys.

The United Nations Convention on the Law of the Sea was drafted in 1970 as the primary tool for international policy and governance over the ocean. Opened for signature in 1982, it was signed by 119 countries in that first year and ratified to bring it into effect in 1994. The United States, however, was the only major maritime power that did not sign the treaty. Though President Clinton signed in 1998, the Senate refused to ratify.[248] We have policies for protecting songbirds, eagles, and owls," Earle stated in an interview with me. "We have international agreements looking at migration routes for birds and animals that travel across the land. In the ocean, we are really behind the curve in terms of protecting the wildlife that is there."[249]

In early 2006, President George W. Bush was shown a documentary by Jean-Michel Cousteau about the magnificent biological resources held within a remote Hawaiian islands chain. At a White House dinner that same evening, Bush was seated at the same table as Earle, from whom he reported receiving "a pretty good lecture about life."[250] The ability of these two science-storytellers to communicate through their words, their pictures, and their passion the need for marine protection was potent enough to convince the leader of the free world to act on behalf of the ocean. In June of the same year, President Bush, flanked by Jean-Michel and Sylvia, set his pen to an order establishing what was then the world's largest federally protected marine sanctuary, Hawaii's Papahānaumokuākea Marine National Monument (figure 19). This newly

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[248] Earle, *The World is Blue,* 211.
[249] Earle, interview by author, 2011.
[250] See Miguel Llanos, "Bush Creates World's Biggest Ocean Preserve," *MSNBC and Associated Press,* June 16, 2006, accessed May 20, 2017, http://www.nbcnews.com/id/13300363/ns/us_news-environment/t/bush-creates-worlds-biggest-ocean-preserve/#.WUwpETPMyRs.

protected area encompassed eighty-four million acres and was home to 7,000 species of birds, fish and marine mammals, at least a quarter of which are unique to Hawaii.



Figure 19. President George W. Bush signing order establishing Papahānaumokuākea Marine National Monument, June, 2006. *Source:* JimWatson, AFP, Getty, Public Domain.

It was a remarkable display of leadership that illustrated the point that stewardship could be embraced by those on both sides of the aisle. Still, it wasn't until President Obama, that the United States crafted a national policy. On July 19, 2010, President Obama established our nation's first comprehensive stewardship policy for the oceans, our coasts, and Great Lakes.[251] Obama's legacy as "The Ocean President" was unparalleled. Not only did he quadruple the size of Hawaii's Papahānaumokuākea Marine National Monument and expand six-fold the Pacific Remote Islands Marine National Monument that his predecessor, George W. Bush had created, he also established the first

[251] Obama White House, "National Ocean Policy Implementation Plan," *National Ocean Council*, accessed June 23, 2017, https://obamawhitehouse.archives.gov/administration/eop/oceans/policy.

marine monument in the Atlantic.[252] Both former U.S. Presidents had used the story of ocean science to bring America into the narrative of ocean protection.

In 2016, before taking office, President Trump vowed to protect federal lands (under which these ocean monuments are categorized). In an interview with CBS News, he stated, "I want to keep the lands great. . . This is magnificent land. And we have to be great stewards of this land."[253] At the time of this writing, however, only eleven months into his tenure as President, Trump is acting to revoke existing monuments in a challenge to the Antiquities Act -- a 1906 law passed by Teddy Roosevelt, which allows presidents to unilaterally protect areas of land without congressional approval. Trump has stocked his cabinet with environmental foes such as long-time opponent of federal lands protection, Ryan Zinke as Interior Secretary, oil executive Rex Tillerson as Secretary of State, and climate change denier, Scott Pruitt as head of the Environmental Protection Agency. Since taking office, all climate data has been removed from the official White House website, as has the EPA's entire climate change page, stating at the time of writing, "We are currently updating our website to reflect EPA's priorities under the leadership of President Trump and Administrator Pruitt."[254] This "leadership" has also directed the Center for Disease Control to ban words such as "science-based" and

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[252] Ed Yong, "Obama: The Ocean President," *The Atlantic,* January 4, 2017, accessed June 20, 2017, https://www.theatlantic.com/science/archive/2017/01/obama-the-ocean-president/512135/.
[253] Ibid.
[254] See EPA website, accessed October 24 2017, https://www.epa.gov/sites/production/files/signpost/cc.html (accessed October 24 2017).

"evidence-based."[255] The Trump administration has replaced the data driven story of science with its own fictitious narrative, which may indeed serve to be the greatest liability to the health of our people, our ocean and our planet.

The frontier mentality that served to co-opt exploration is playing out across the American media landscape in terms of co-opting science and its communication. It seems the role of conquest in terms of gaining an audience has taken priority over the integrity of the factual evidence. One needs only "believe" something to be true in order for it to be so. This is evident in debates raging from vaccination to climate change. The democratization of media has created an opportunity for people to make decisions based on motivated reasoning that serves their own value set. In other words, feelings often trump fact. For example, in 2016, when CNN's Alisyn Camerota questioned political pundit and former Speaker of the House, Newt Gingrich about fact vs. belief in terms of violence in America, he responded, "Liberals have a whole set of statistics that theoretically may be right, but it's not where human beings are. I will go with how people feel and let you go with the theoreticians."[256] To discard facts for political gain is certainly nothing new, but in terms of science, it can be life-threatening.

When it comes to the public's understanding of science, there is an enormous gray area between belief, truth (which sometimes overlap) and fact; this poses an

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[255] See for example, Eileen AJ Connelly, "Trump Administration Bans CDC from using these Seven Words," *The New York Post,* December 16, 2017, accessed December 16, 2017, https://nypost.com/2017/12/16/trump-administration-bans-cdc-from-using-these-7-words/.

[256] See video of Camerota's interview with Gingrich at http://www.cnn.com/videos/tv/2016/12/01/gingrich-camerota-crime-stats-newday.cnn (accessed October 20, 2017).

epistemological problem. William James (1842- 1910), American philosopher, psychologist, physician and one the leading thinkers of the nineteenth century, subscribed to the notion that the value of any truth was utterly dependent upon its use to the person who held it. In his view, a belief was true if it worked for all of us and guided us through our semi-hospitable world, offering ways of acting in response to precarious situations.[257] In "Pragmatism's Conception of Truth," he wrote,

> "The most ancient parts of truth . . . also once were plastic. They also were called true for human reasons. They also mediated between still earlier truths and what in those days were novel observations. Purely objective truth, truth in whose establishment the function of giving human satisfaction in marrying previous parts of experience with newer parts played no role whatsoever, is nowhere to be found. The reasons why we call things true is the reason why they are true, for 'to be true' means only to perform this marriage-function.[258]

Though James wrote these words over a century ago, they still carry weight -- for better and for worse. Some use the "plasticity" of truth as a revisionist means to discount science rather than using it to provide meaning to the science. To many Americans, a topic gleans its importance when the audience views it as related to his or her life. According to Carl Warren, the author of Modern News Reporting, "any human being is firstly interested in himself and afterwards in whatever is close to him, either physically or mentally: his job, health, family, etc."[259] This is, however, very much a Euro-centric attitude. The Indigenous perspective offers that the community, not the self, is of

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[257] Bruce Kuklick, introduction to *Pragmatism,* by William James, edited by Bruce Kuklick (Indianapolis: Hackett Publishing Company, 1995), xiv.
[258] William James, "Pragmatism's Conception of Truth, Lecture 6," *Pragmatism: A New Name for Some Old Ways of Thinking* (New York: Longman Green and Co., 1907), 83.
[259] Carl Warren, *Modern News Reporting* (New York: Harper & Brothers, 1959), 18.

paramount importance. This perspective also offers the ability to include additional truths that Western science may hold in its blind spot.

It is no secret that there has always been a lack of diversity in the sciences, especially when it comes to the Indigenous voice. Though there is a growing number of Indigenous people choosing to study science or make it their career, Native communities have long been seen as mere "research subjects" by Western scientists. "There's a perception within the Academy that Indigenous knowledge is less than and it's not as privileged as the Western way of understanding the world," wrote Gladys Rowe, a Cree Ph.D. student from the University of Manitoba in a letter supporting the 2017 March for Science.[260] She expressed the immense challenge of proving to the scientific community that Indigenous knowledge is just as important as western science. "In Canada, specifically, a lot of institutions talk about 'Indigenizing' — but when you actually get down to the work of it, there's so many barriers and a lot of those barriers have to do with what is framed as science."[261] Many Western scientists generally distinguish between scientific knowledge and Indigenous knowledge by claiming science is universal whereas Indigenous knowledge relates only to Native people and their understanding of the world. But perhaps we need to look at these as complimentary rather than competing ideas. Indigenous knowledge can feed science in ways that can enable us to appreciate the world in a deeper and more holistic way. I argue that western scientists and their

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[260] Gladys Rowe, as quoted by Tim Fontaine in "'Let Our Indigenous Voice be Heard,'" *CBC News,* April 22, 2017, accessed November 22, 2017, http://www.cbc.ca/news/indigenous/indigenous-scientists-march-for-science-2017-1.4077662.
[261] Ibid.

institutions must recognize this and expand participation in the narrative in order to engage the *whole* of the public.

In a digital landscape that has become so fractured, expanding the science narrative to engage a diverse audience poses a mammoth challenge. One way to do so is via the social sphere of visual storytelling, which I will discuss next.

Social Science

Having worked for two decades as an environmental filmmaker, writer and producer for such broadcast entities as the PBS series, NATURE, National Geographic, Discovery, Animal Planet, and theatrical documentaries, I have been able to keep my finger on the pulse of the trends of the industry and science communication. If we look back at American-made science and natural history documentaries of the 1980s and 90s, we find most employed a format featuring a “Voice of God” narration and sit-down interviews with scientists or ecologists delivering relevant facts in a passive, informational way without much emotion attached to it. The scientist's role was primarily relegated to that of expert, which is very different than that of "character."

In stark contrast, today's competitive non-fiction media market venerates entertainment value, often to the detriment of educational value. Though this is equally true for science programming (industry executives consistently instruct producers to "hide" the science in a compelling story), there are those of us who are working towards the fine balance of educating while entertaining by constructing a compelling story *out of* the science.

Many of the programs of the past decade have employed a "personal journey" model where the scientist leads the viewer on a quest of some sort. This is the case with *Mission Blue* (2014), the feature documentary about Sylvia Earle, which introduces viewers to the legendary oceanographer and her campaign to create a global network of protected marine sanctuaries. Earle understands the value of a strong visual story when communicating the narrative of the ocean. "I've worked with many photographers and filmmakers over the years and have learned a lot about the way artists with cameras see the world," states Earle. "They try to tell stories. They try to take viewers to another place, to hold their attention. It's telling a truth while telling a story."[262]

These newer films are in a sense a revival of the Cousteau-esque, whereby viewers travel into the field, ocean, or lab and make discoveries *with* the scientists – reveling in their success and commiserating in their failures. An emotional connection to the scientist (or science itself) must be established for the audience to feel actively engaged. To achieve this connection, I contend that the scientist's role must expand beyond addressing the "what" and the "how," and root itself in exploring the "*why*." *That* is where passion for the subject lies; "the why" is what connects. The goal is not to bring the public into the method of the science; it is about involving them in the science narrative. In addition to the facts, "the why" offers insight to opinions held by scientists

[262] Brian Clark Howard, "Q & A: Sylvia Earle's Personal Journey and Why the Ocean is Vital to Life," *National Geographic*, published online August 16, 2014, accessed May 26, 2017, http://news.nationalgeographic.com/news/2014/08/140815-sylvia-earle-mission-blue-documentary-film-ocean-environment/.

as well as what excites them and drives them to do their work. The characters are viewed as human before scientist – and that makes them relatable, and yes, entertaining.

In the last section, I discussed the emergence of self-celebrity on the digital landscape. About a decade ago, the environmental movement was saturated with celebrity activists such as Leonardo DiCaprio, Harrison Ford, and Scarlet Johansson. Just about every environmental cause had its celebrity spokesperson. Though they still hold true to their causes today, notably DiCaprio with *Before the Flood* (2016), his recent feature documentary about climate change, we are finding a growing trend of scientists-turned-celebrity who are working to take their message to the public directly. In "An Introduction to Social Media for Scientists," science communicators Holly Bik and Miriam Goldstein state, "Scientists have been harnessing the power of social media to fundamentally speed up the pace at which they are developing and sharing knowledge, both within scientific communities and with the general public."[263]

In my view, social media provides a golden opportunity for scientists to expand their reach and craft a science narrative that speaks to a far more diverse audience. One marine scientist who is doing just this is Dr. John Edward Norwood Veron who goes by "Charlie Veron." Nicknamed, "The Godfather of Coral," he is perhaps the most notable coral reef specialist in the world and the only living person to have studied every coral system around the globe, naming about a quarter of them himself.[264] I had the

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[263] Holly M. Bik and Miriam C. Goldstein, "An Introduction to Social Media for Scientists," *PLoS Biol* 11, no. 4 (April 23, 2013), accessed May 23, 2017, http://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1001535.
[264] Veron in interview by author, Honolulu, HI, July 2, 2011.

opportunity to interview him in 2011, while working on the film, *Our Blue Canoe* and he shared his exit from the ivory tower and into the arena of the public:

> I work as a scientist, but I feel that science has done its part in the climate change/ocean acidification thing. I have got to now change my hat to try to be a communicator, and so I give speeches, write books, and magazine articles, I talk to schools, and use social media. I do all that because I think now, that is what matters. I would love to go back to my science, but my science now is not going to make the difference that I can in being a communicator. I love talking to people . . .who try to take the knowledge of science to the bigger wider world. [265]

Charlie Veron also knows the work he wants his work to do. In discussing the art of communication, he expresses that too many scientists have a difficult time getting past the jargon. "Scientists are not good at that, they love detail," he tells me. "I love detail, I have a head full of stuff, but it has got to be all boiled down to something that is meaningful to people who are not scientists, and that is what is so important now."[266]

Of course, not every scientist possesses the charisma, nor the desire, to communicate publicly. Many are far more comfortable underwater than up on Facebook, or behind a microscope than in front of a lens. Some argue that when scientists take on the additional role as communicator or popularizer, it diminishes the value of their science. Others, like geographer and oceanographer Dawn Wright, claim it is not only necessary but in fact, increases the pertinence of their research.

Dr. Wright, Chief Scientist at Environmental Systems Research Institute (ESRI), is one of the most influential voices in ocean science today. As a leading authority in Geographic Information System (GIS) technology, she played a key role in creating the

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[265] Ibid.
[266] Ibid.

first GIS data model for the oceans and was the first African American female to explore the ocean floor in the Woods Hole Oceanographic Institute's deep sea submersible, ALVIN. She is also an unabashed advocate for the popularization of science, having gone so far as to inspire a Lego character (figure 20).



Figure 20. Lego figure of Dawn Wright.
Source: Dawn Wright, Twitter, February 3, 2017, https://twitter.com/deepseadawn

Possessing the user name and twitter handle, @deepseadawn, she is a prolific social networker, using multiple platforms to get the message out to the public. "You don't have to do outreach full-time in order to do it all," she states in an interview with Brooke Smith of COMPASS. "There are ways to get a far-reaching bang from a single buck."[267]

That "single buck" is gaining value in social currency through an expanding network of "social ecosystems" that support the scientific and scholarly use of social media. For example, scientists are using collaborative project spaces including Google

[267] Brooke Smith, "Dawn Wright: On Science Communication, Social Media, And Joining Our Board," COMPASS, Nov. 17, 2014, accessed June 17, 2017, https://www.compassscicomm.org/single-post/2017/03/30/Dawn-Wright-On-Science-Communication-Social-Media-And-Joining-Our-Board.

Docs, Figshare, Wikipedia, and GitHub, blogs and microblogs such as Research Blogging and Twitter, online communities of YouTube, CiteULike, and Zotero, and professional networking sites such as Facebook, LinkedIn, Mendeley, and ResearchGate to develop new ideas and collaborate in concrete scientific output.[268] According to Dr. Wright, use of social media should be considered in relation to "traditional" forms of academic service such as participation on a committee or a board, coordination of a seminar, professional reviews of books, papers, proposals, delivery of a public lectures, etc.

Wright shared with me a story map that she created for the American Geophysical Union (AGU) Fall meeting in 2013 (modified in 2015) titled "Participation in Social Media as Academic Service," in which she shares personal and institutional/ organizational perspectives on how appropriate social media interaction can be viewed as a "necessary (even daily) part of professional practice and thus yet another moniker of good scientific behavior (especially as a model for students and early-career faculty), and of the 'gift culture' of scholarship."[269] She offers applications from "live tweeting" of events, ideas, and summary points from scholarly conferences, to advertising calls for

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[268] See Christiana M. Cooper, "Contemporary Advocacy Filmmaking: Campaigns for Change," Masters Thesis, Montana State University, May 2015, accessed June 14, 2017, http://scholarworks.montana.edu/xmlui/bitstream/handle/1/9444/CooperC1215.pdf?sequence=1&isAllowed=y; see also Emily Darling, David Shiffman, Isabelle M. Côté, and Joshua A. Drew, The Role of Twitter in the Life Cycle of a Scientific Publication," *Ideas in Ecology and Evolution* 6, no. 1 (May, 2013): 32–43, accessed June 14, 2017, https://www.researchgate.net/publication/236597362_The_role_of_Twitter_in_the_life_cycle_of_a_scientific_publication.

[269] Dawn Wright, "Participation in Social Media as Academic Service," Story Map, accessed June17, 2017, http://story.maps.arcgis.com/apps/MapTour/index.html?appid=393a423e2c4c4570a3f479bc6bb180a&webmap=6b1e4f428ffa411b96b0e49d214ed17f.

special issues, proposals, and participation in specialists meetings, to showcasing the real-time effects of natural disasters via social media feeds embedded in maps.

Wright advocates for scientists use all platforms at their disposal to get science messaging across. In discussing the importance of science communication, she states,

> The positive reinforcement of helping people to see more clearly where science is concerned, or even to change their minds is quite a powerful motivator. And then there's the fact that we are facing some of the most of vexing and daunting problems in human history (climate change, oceans in crisis, etc.), and we should do what we can to 'speak truth to power.' I think communicating also helps me to be a better scientist.[270]

Wright is not alone in her sentiment. The lines between scientist and advocate are blurring and making for better science.[271] Researchers are finding that Twitter can provide valuable contribution to scientific publishing in the 21st century and can help us understand human pattern and process. In a study called "The Role of Twitter in the Life Cycle of a Scientific Publication," the authors write,

> At the start of the 'life cycle' of a scientific publication, Twitter provides a large virtual department of colleagues that can help to rapidly generate, share and refine new ideas. As ideas become manuscripts, Twitter can be used as an informal arena for the pre-review of works in progress. Finally, tweeting published findings can communicate research to a broad audience of other researchers, decision makers, journalists and the general public that can amplify the scientific and social impact of publications.[272]

The fact that a growing number of ocean scientists are using visual and social media as a platform for communication indicates a shift in not only role, but in the

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[270] Smith, "Dawn Wright: On Science Communication."
[271] Peter C. List, "Rachel Carson and George Wallace: Why Public Environmental Scientists Should be Advocates for Nature," *Rachel Carson, Legacy and Challenge,* Lisa H. Sideris and Kathleen Dean Moore, eds. (New York: State University of New York Press, 2008), 41-59.
[272] Darling, et al, 2.

identity of the "popularizer." No longer reliant on an interpreter to convey the story of their science, scientists now have avenues through which they can transcend the role of an expert that merely dispenses factual information. Through Twitter, Facebook, and YouTube, for example, they can present themselves on a level social field with the general public with whom they can engage in discussions, express their opinions, share the process of the science, and advocate for issues they care about.

Dan Kahan, a social scientist who spearheads the Cultural Cognition Project at Yale University has been exploring the cultural influence on people's views towards science topics. His work has given rise to the emerging field of the science of science communication, which he describes as a multi-disciplinary field that investigates the processes that enable ordinary citizens to form beliefs consistent with the best available scientific evidence, the conditions that impede the formation of such beliefs, and the strategies that can be employed to avoid or ameliorate such conditions.[273] Incorporating research from a large number of social science arenas including risk perception and communication, social norms, and behavior change, and emotion, Kahan advocates for "an approach to science communication that is genuinely evidence-based from beginning to end."[274] This is an effort to minimize political polarization around certain science topics, thereby increasing the chance of acceptance among a larger portion of the

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[273] See Daniel Kahan's course description for "Science of Science Communication" at Yale University, http://www.culturalcognition.net/blog/2013/1/15/yale-university-science-of-science-communication-course.html (accessed, May 23, 2017).

[274] Daniel Kahan, "Making Climate Science Communication Evidence Based—All the Way Down," *Culture, Politics and Climate Change: How Information Shapes our Common Future,* D.A. Crow & M. T. Boykoff, eds. (New York: Routledge, 2014), 203 - 220.

population. Larger, but not all. As sound as Kahan's method may be, it is steeped in Western science. I can't help but wonder the range it would have if it included Indigenous science as well.

Film as a medium has roots planted in the arts and humanities. Science and environmental films, however, float in a limbo between the disciplines of art and science. I believe this has been a problem for the public's understanding of science as it has limited the discourse and has resulted in "preaching to the choir." If the work we want our films to accomplish is to educate and engage in order to effect change, science media must also occupy the arena of the social sciences.

All too often, science is shared with the American public via the media as an "end result" rather than a process by which hypotheses are made, proven or disproven, and built upon. The public is "told" what to think about an issue, rather than being engaged in its meaning to them on a personal or social scale. It has thus become easy for Americans to discount science when what they experience as a personal reality lies in contrast to what the "results" of the science dictates; for example, if it's 30-degrees-below-zero outside, "global warming" must be a hoax. As more and more scientists enter the public arena and use the media to share the research *process* and the evidence of science at work in addressing the needs of a person, a family, or a community -- again, "the why" of the science -- the more likely the public will come to embrace it and use it to inform their decisions. The dissemination of knowledge is indeed a powerful thing, but quantifying the impact presents its own set of challenges as I will explore in the following section.

To What Depth? Measuring Media's Impact

As we have discussed, bringing ocean science into the arena of public discourse has become the responsibility – and for some, the outright mission -- of both the scientists and of media producers. Since the age of Cousteau, documentaries have increasingly become recognized as a key medium for communicating environmental issues and inspiring social change. As an environmental filmmaker, I strive as most of us do in this industry to produce films that move the needle in terms of social impact. Gauging the impact of a film, however, is an elusive pursuit. Scouring the web, one will find hundreds of articles about "films that make a difference," but few can actually attest to the formula for which they do so.

That being said, a growing number of organizations are beginning to offer tools to better understand and measure the impacts of advocacy films. There is currently a bold joint venture between two non-profit organizations working to assist documentary filmmakers in maximizing the social impact of their work. North Carolina-based, Working Films, one the nation's leading independent media organizations, and the BritDoc Foundation of London have been drawing on qualitative and quantitative analysis, focus groups, and media analysis to asses impact of films. BritDoc has created the online resource, "The Impact Field Guide & Toolkit – From Art to Impact."[275]

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[275] See "The Impact Field Guide & Toolkit," accessed June 17, 2017, https://impactguide.orgaccessed May 23, 2017). For more on advocacy in film, see Cooper, "Contemporary Advocacy Filmmaking: Campaigns for Change," (Masters Thesis, Montana State University), May 2015, accessed June 14, 2017, http://scholarworks.montana.edu/xmlui/bitstream/handle/1/9444/CooperC1215.pdf?sequence=1&isAllowed=y.

The Harmony Institute (harmonylabs.org) is another organization working in this evolving field of impact production that brings together a team of researchers, strategists, data scientists, designers and engineers in constructing an evidence-approach model to leverage media's power to benefit society. They have established a unique online application called *Story Pilot* to which independent documentary producers may submit their film for free and glean its social impacts through metrics in sixteen social issue categories including education, health, and human rights. Story Pilot has mapped 756 documentaries to date.[276]

Communication is one thing, engagement is something else, entirely. I conducted a public online survey of 100 participants to help me gauge, to a small extent, environmental media's efficacy. I asked respondents to rank on a scale of 1 - 5, being the highest, how well they felt ocean issues were being covered in the media. 71.2 % gave it a poor rating of 2 or below (figure 21).

[276] See Story Pilot website, accessed May 23, 2017, https://storypilot.org/home.

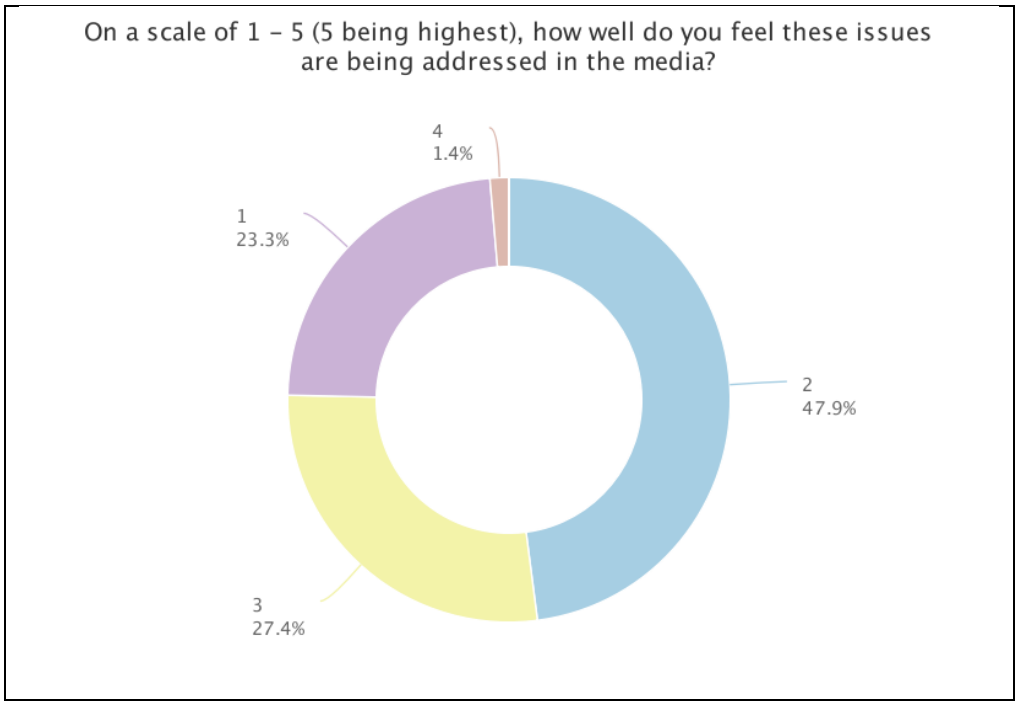


Figure 21. Survey 1 results from "Turning the Tide: Movie to Movement" online public survey, conducted by author, June, 2017. *Source:* Author.

Another question asked participants to rank on a scale of 1 - 5, how well they felt they were provided with clear ideas and opportunities for taking action after watching an ocean issues documentary. Over 82% rated it 3 or under, suggesting there is more work to be done in providing concrete solutions (figure 22).

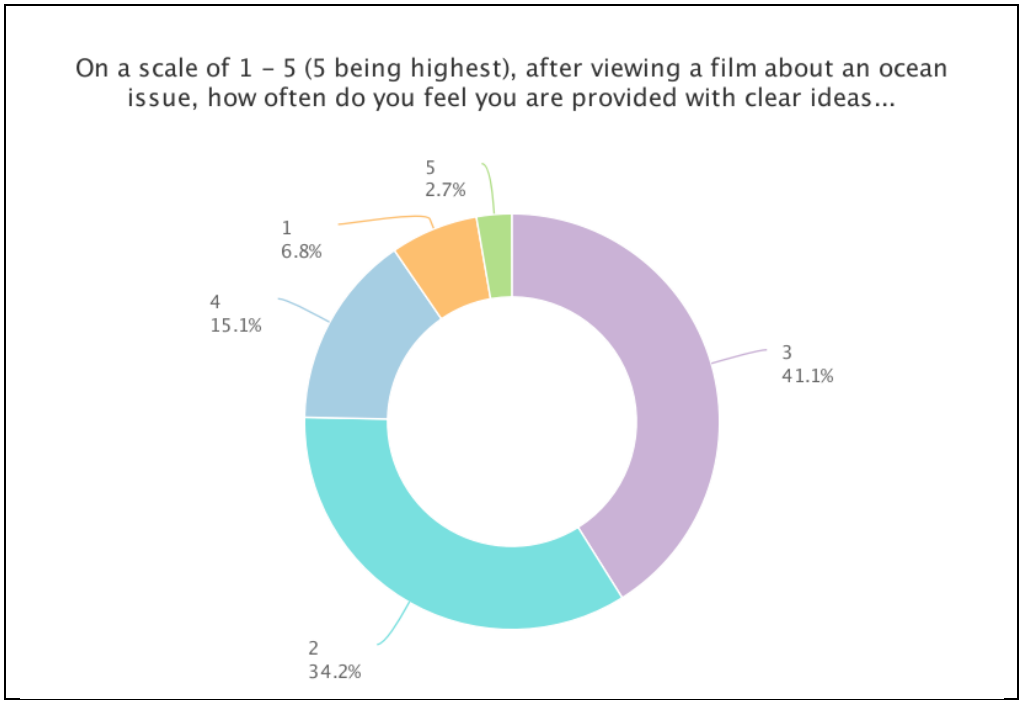


Figure 22. Survey 2 results from "Turning the Tide: Movie to Movement" online public survey, conducted by author, June, 2017. *Source:* Author.

In a comment box provided for people to expand, one anonymous respondent offered a social appeal, writing:

> I continually watch films that are either inaccurate scientifically, and don't provide a trustworthy base of information; if they do, they are so dry, boring and depressing, that no one wants to watch. Films need to be fun, interesting, upbeat, and inspiring. Media advocates need to learn a few lessons about sociology if we want people to take action for conservation.[277]

It is important to recognize that social impact is rarely created through the production of a film alone; rather, the film should occupy one aspect of a broader trans-media campaign. And like all campaigns, this requires strategy. One of the greatest missteps an environmental producer can make is trying to have their film "do it all" -- educate, inspire, entertain, and shift behavior. Assigning a specific role to the film at the

[277] From author's "Turning the Tide: Movie to Movement" survey results.

outset of production enables the producer to approach an issue in a much more comprehensive way. For example, if the film's role is to simply act as "the hook" to raise awareness about a particular issue, the content creator can more effectively make use of other platforms (including the web, print articles, social media outlets, blogs, community screenings, etc.) to achieve other goals. By using those platforms to explore different aspects of the story and craft arguments to appeal to distinct niche audiences, the producer will create more sustaining impact. Galvanizing the public to care -- and act -- on ocean issues hinges upon spinning the science into story that is easily accessible, vastly relatable, and widely distributed.

Towards a Collective Narrative

This chapter has examined the role and pitfalls of narrative ownership of the ocean through scientists and historians, politicians and producers who are attempting to conduct their work on the trembling ground of a quickly shifting media landscape. We have explored how the idea of ownership, couched in a frontier mentality, has served to color -- for better and worse -- our relationship with the ocean and with the public's understanding of science.

In assessing the current state of science communication, I have called for scientists to enter the social arena and share the narrative of the ocean's story and to include indigenous knowledge in that narrative. I argue that only when they pair their science with advocacy and strong messaging through outlets such as visual and social media, will we begin to move the needle on ocean protection. For this to succeed, I

contest that we need to go even farther. We must create a collective narrative of the ocean, based upon accompaniment.

To this end, I have founded the 501(c)(3) organization, Ocean Media Institute (OMI), which serves to expand the public's understanding of ocean science through the collaborative creation and distribution of innovative visual media and artistic approaches to ocean literacy. I will introduce this organization as the culmination of my work as filmmaker, scientist, and educator in the next and final chapter of this dissertation.

CHAPTER FOUR

CRAFTING DEEPER STORIES: THE OCEAN MEDIA INSTITUTE

"Never tell your audience what to think. Lead them to feel." (Author) [278]

A little over two years ago, I was talking with Jeff Reed, a friend and colleague, about the "purpose" of our work as science and natural history filmmakers. Though we both felt good about our potential to reach people and educate them about an animal or ecosystem for example, we also felt the mode of our work was limiting. Personally, I wanted to do more than simply create films that informed. I wanted to engage the public in something deeper, something in which they could take an active role. As a film professor at Montana State University, I enjoyed the opportunity to pay it forward and I wanted find a way to expand on that. As I indicated in the introduction of this dissertation, the ocean runs through my blood. I knew that sense of purpose I was seeking would somehow have to be channeled into its protection.

It was also at this time that I was considering project ideas for the companion to this dissertation. I told Jeff that I had an idea to create a "blueprint" for an organization that brought together visual storytelling, ocean science communication, and collaborative education. "I'm thinking of calling it the Ocean Media Institute," I said. "OMI," he responded, nodding thoughtfully, "I like it. Want some help?" Within three months of that initial conversation, I not only had a website, but a creative director and partner. I

[278] I use this phrase as a constant refrain to my film and writing students. I feel it is at the heart of the mission of messaging.

had cobbled together a mission statement and some initiative ideas, put up a Facebook page and found some people interested in joining the founding board. Before I knew it, the idea I had for a "someday organization" was a fully-fledged 501(c)(3) corporation. Steadily expanding over the past two years, OMI is now running multiple programs, working right here in land-locked Montana as well as in coastal communities as far away as the Philippines.

This chapter orients readers to my development of the Ocean Media Institute, which is in essence a culmination of the work my work needs to do. At the core of that work is the idea of building a collective narrative through accompaniment.

To Educate, Collaborate and Creatively Communicate

Though there are many institutions and organizations creating ocean media, many of them are limited in resources or work independently and are insular by design. They are therefore limited in their reach, and thus, their impact. I have established the Ocean Media Institute (OMI) to be unique in design as a global hub among institutions that acts as the connective tissue between them, bringing together marine scientists and students, media makers and policy-makers, educators and the public in an effort to work collaboratively to produce, openly distribute, and assess the impact of ocean-related media. I have developed a three-prong approach to OMI's work: 1) Education through science communication seminars and workshops; 2) Collaboration by working with and/or sharing resources with scientists, filmmakers, or other marine-based organizations

and institutions; and 3) Creative Communication through the production of original visual media that promotes ocean science and conservation.

Our team at present is small: As the organization's founder, I serve in the role of Executive Director. As mentioned previously, Jeff Reed, who holds an MFA in Science and Natural History Filmmaking, is our Chief Operations Officer, Director of Photography, and Web Designer. We have a small Board of Directors comprised of ocean educators, filmmakers and scientists spanning east to west coasts. Despite our compact team, we have managed to achieve a great deal over the past two years in all three focus areas of our work. I have provided screen grabs of our entire website (oceanmediainstitute.org) in the Appendix of this dissertation to illustrate some of the visual components of our projects. The following three sections will detail the work we are doing in each of our focus areas.

OMI Focus Area 1: Education

In the area of education, the Ocean Media Institute provides a variety of workshops, seminars and media labs, all of which can be tailored to suit the group's need. Following is a current list of OMI workshops along with their descriptions:

Ocean Media Labs: In these workshops, we bring together scientists and students, artists and educators, media-makers and policy makers to produce strong, innovative narratives and work on targeted transmedia campaigns that promote ocean health, awareness, and policy.

Science-to-Story Seminars: These seminars are designed to teach the skills necessary to spin a scientific idea into a compelling story. No matter how important the message may be, when it comes to reaching a general audience in an impactful way, the facts alone won't cut it. But good science can make for great narratives that do more than just inform -- they can inspire. This seminar, led by our team of award-winning filmmakers, writers, and science communicators, will equip participants with the tools they need to sharpen storytelling skills in order to imbue their subjects with action, emotion, and life.

The Art of Science Filmmaking: From barebones to advanced production techniques, we draw from our own production experience to provide the tools and knowledge needed to visualize the science in an entertaining way. From composition and lighting, to slow motion and time lapse, we cover how to visually captivate the audience. Every production comes with its own challenges, and participants learn how to navigate these, adapting their gear and technique to the situation at hand.

Crafting the Story: Whether a scientist, filmmaker, or journalist, we help develop the strategies necessary for spinning the science into a compelling and whip-smart story. Environmental storytelling involves a range of creative choices about narrative, structure, point of view, style, and more. Engaging in a variety of exercises designed to flex the creative muscle, we explore the story devices that work to draw audiences into an experience and take them on an unforgettable journey. Participants learn how to develop strong interview techniques, define a story arc, shape scenes, and

create dramatic tension. By the end of the workshop, participants walk away better writers with sound proficiency in the art of telling creative and potent scientific stories.

In the Hot Seat: No matter which side of the camera one finds him or herself on, interviews can be a nerve-wracking experience. This workshop is designed to ease the exchange between scientist and media producer by teaching the "rules of engagement." Through practical exercises and role-play, we share strategic tips and techniques for establishing trust between interviewer and interviewee. From exploring how to best frame questions that elicit dynamic and informative responses, to delivering compelling answers that are simple, yet not "dumbed down," to avoiding misquotes and being taken out of context, to what camera angle, eye-line, and lighting can convey to an audience, participants learn all they need to know about getting and giving the best interviews in order to communicate the story of the science with confidence.

We have conducted various workshops and seminars across the country starting with our first workshop in 2015 called *The Art of Science Storytelling* at the Metcalf Institute for Environmental Reporting in Rhode Island. There, Jeff Reed and I taught twenty-five scientists from across the state how to use their smartphones to craft a compelling visual story about their science. In this day-long workshop, participants learned the difference between crafting a visual story and a written one, interview techniques, character development (both human and non), story arc and structure, and a hands-on lesson in the technical aspects of filming with their smartphones in the field, including composition, lighting and exposure, camera angles and moves, interview set-up, audio, and editing. We also provide exclusive access to a tailored web-page that

contains lessons, video-tutorials, and additional information not covered in the workshop (figure 23).

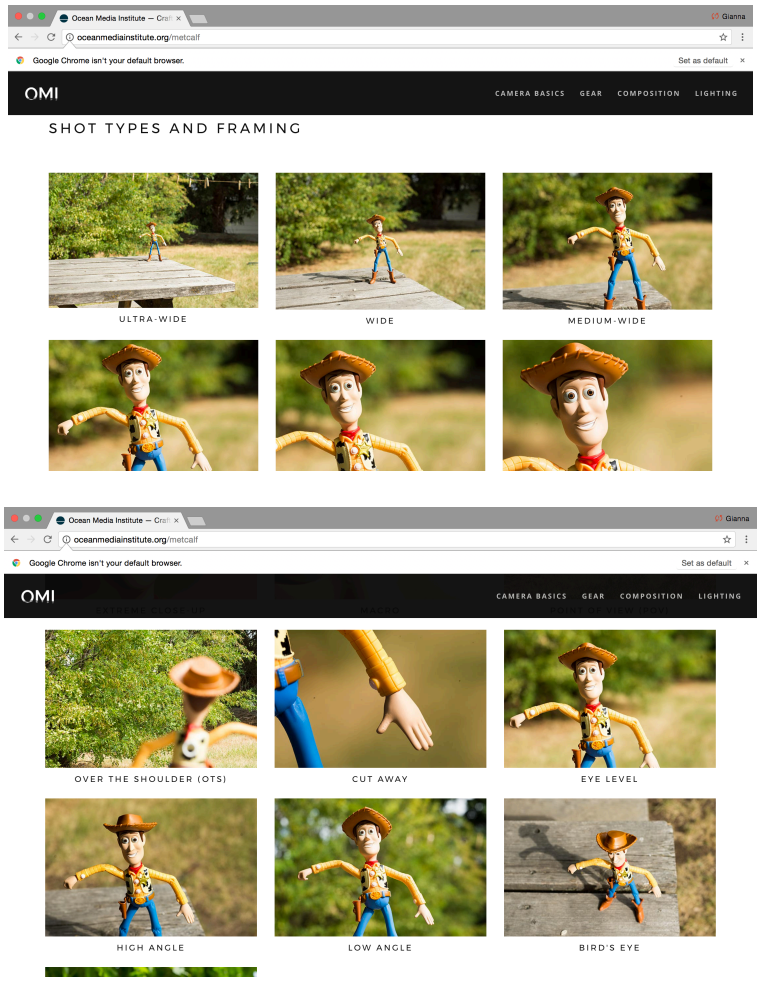


Figure 23. "Shot Types and Framing" Ocean Media Institute custom webpage for Metcalf Institute's Art of Science Storytelling Workshop. Copyright 2015, Ocean Media Institute. *Source:* Ocean Media Institute.

To date, OMI has conducted seminars and workshops at the Big Sky Documentary Film Festival and the International Wildlife Film Festival, in Missoula, MT, the Blue Ocean Film Festival and Conservation Summit in St. Petersburg, FL, The

Eagle Hill Institute in Steuben, ME, and the Communication of Science Conference at Harvard University in Cambridge, MA.

In the spring of 2017, OMI received a small grant to launch a new ocean literacy program in Bozeman, Montana called, "Mountain Mermaids and Mermen." This pilot program engages the youth of our land-locked state in ocean leadership workshops, where they will participate in artistic approaches to ocean conservation while exploring the connection between mountain, river valley, and ocean. In Montana, from the crops we grow, to the food we eat, to the very air we breathe, the health of the ocean is not only important, it's elemental. Yet there's virtually no ocean education in our community. For states distanced from the coast, ocean literacy is the missing element to fully understanding how our planet works. Without it, it is difficult to make well-informed decisions about our environment. Our project addresses this dire need by reinforcing the connection Montanans have to the ocean and fostering lasting stewardship. Culminating in a youth-led, community-wide action project, our Mountain Mermaids and Mermen come away empowered as environmental stewards and armed with the skills to pay it forward, serving as models for inland youth elsewhere.

OMI Focus Area 2: Collaboration

In the realm of collaboration, we are working with a growing number of conservation organizations, institutions and individuals to share resources. One of our signature programs in this area is called our *Ocean Media Explorers* program through which we pair emerging media makers with marine scientists or research teams on

expedition to produce visual media including short films, photo essays, video-blogs, etc. about the research being conducted. Unlike expeditions that bring on a photographer, journalist, filmmaker, or intern to document the expedition for internal use, the media created through the *Media Explorer* program is shared by all parties (OMI, content creator, scientists, participating organizations/institutions) and promoted and distributed via OMI and members in our partner network. We also produce a web-companion for the project that highlights the research, scientists, producer, and incorporates additional information, including visualizations of some of the science. So the science gains a far broader reach.

The impetus for the program arose when OMI's own Jeff Reed had the opportunity to document the HADES Expedition in 2014, in which NOAA, WHOI, and a consortium of international teams set out to carry out the first-ever systematic study of the 700-mile long Kermadek Trench, north of New Zealand. The trench lies in the Hadal Zone, the deepest part of our ocean, between 6,000 and 11,000 meters. It turned out to be a fateful cruise. The team had employed the HROV *Nereus*, the United States' most sophisticated submarine for exploring the deep sea, a sub which had plumbed the depths of Challenger Deep (figure 24).

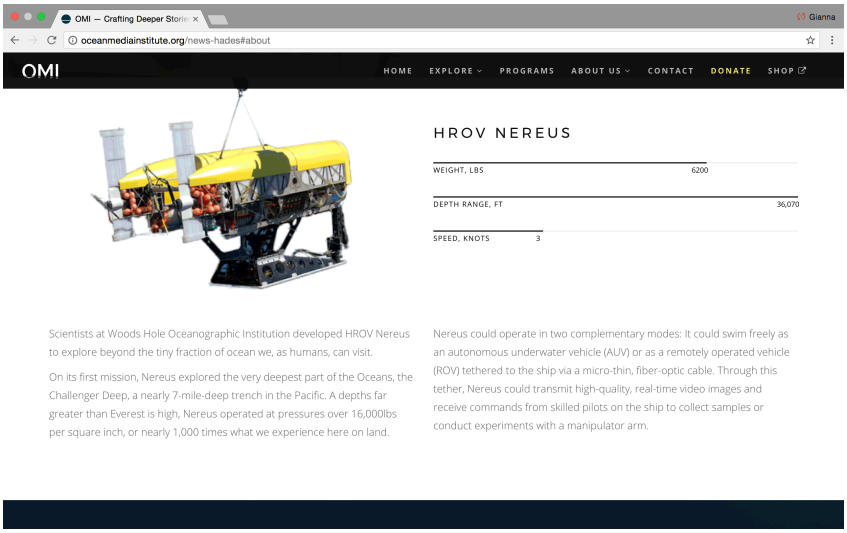


Figure 24. "Nereus," OMI's Companion website for Kermadec Trench Expedition, Copyright 2015, Ocean Media Institute. *Source:* Ocean Media Institute.

In the afternoon of May 10, 2014, thirty days into the forty-day expedition, computer screens aboard the research vessel *R/V Thomas G. Thompson* that were monitoring the images *Nereus* was capturing at 9,990 meters went black. It is not uncommon to lose signal, especially at those depths, but after several hours the team knew something was very wrong. And then pieces of the submersible began appearing at the surface. *Nereus,* under pressure as great as 16,000 pounds per square inch, imploded at a depth of 6.2 miles down.[279] As research moved forward, albeit in limited capacity, Reed continued to document the expedition, creating three videos and poignantly eulogizing *Nereus* and the implications its loss has for exploration, writing:

> Losing *Nereus* meant losing the ability to *interact* with this environment, to explore a massive portion of our planet unknown to us. As a newcomer, the numerous deployments and procedures on this expedition often had the illusion of being routine. Before May 10, I rarely thought

[279] "FAQ: Nereus" Woods Hole Oceanographic Institute, accessed June 1, 2017, http://www.whoi.edu/main/faq-nereus.

> about the risks of exploratory science and the sacrifices one must be willing to make in the name of discovery. I often find myself comparing the deep ocean to space and I think that comparison goes beyond simply sending robots to places we are unable to go. The deep ocean, like space, is unforgiving. It is a frontier, and to try and visit that frontier means accepting that failure is an option. The loss of Nereus was not the result of negligence. There was nobody at fault. The loss of Nereus was an unfortunate cost of exploring the deepest, most unknown parts of our planet. It is a cost I am willing to accept and feel the real tragedy is the time we must now spend unable to explore the deep ocean and remain ignorant of its secrets.[280]

The death of *Nereus* was not only a devastating loss to the ocean exploration community, it is in fact a loss that should be mourned by all of us. Yet, few people learned of the incident, nor were they even aware the submersible existed. This was not a story covered by mass media. In my view, this strikes at the heart of the problem with ocean science communication as it underscores my previous argument that the American public has not been part of the collective narrative of ocean science as they have been with space science. Though there was no loss of human life with the *Nereus* disaster as there was with the *Challenger* disaster of 1986, the scientific implications of its loss are massive. *Nereus* was the most sophisticated submersible the Unites States had in terms of its ability to work deeper than any other. Even now, three years after the incident, the ocean science community still grieves its death. In a recent email to me, Kenneth Kostel, WHOI's Science Writer, wrote,

> It astounds me that in one single, unfortunate event we lost our ability as a species to explore nearly half the depth of the ocean. We should have a fleet of vehicles like *Nereus* routinely traveling to the deepest parts of the seafloor to tell us more about how our planet works and what makes it

[280] Jeff Reed, "On the Loss of Nereus," Kermadek Trench, Ocean Media Institute website, accessed June 4, 2017, http://oceanmediainstitute.org/news-hades.

uniquely able to support such a breathtaking diversity of life.[281]

I posit that the reason we don't have a fleet of vehicles like *Nereus* is the result of my previous observation that the general public lacks investment in marine science because they are not part of the *story* of that science. And that story includes the possibility of failure. In my view, we cannot have a realistic discussion about the value of science until we come to understand that failure is part of the process. When *Nereus* was lost, it provided a golden opportunity to engage the American public in that collective narrative about the process of science; it could have been a teaching moment providing an essential lesson. Inherent in that epic expedition was the terrific intersection of human spirit, technology, and nature. It contained the dramatic and humbling story of the preparation and execution of a historic expedition that was poised to bring about some of the most phenomenal discoveries and offer immense new knowledge about the workings of our planet -- all at the mercy of an "explore me if you dare" ocean whose power can snuff out every bit of the human ingenuity and technical mastery that goes into it in a heartbeat.

The lesson missed was this: as tragic as the death of *Nereus* was, it is not at all a story of "failure." On the contrary, it is the story of resilience. Scientists and explorers never take those hard lessons for granted – they use them, work with them, get better *because* of them. But tragically, the story wasn't told that way. Worse, the story wasn't told much at all except for a few press releases and a FAQ page on WHOI's website. And so that teaching moment, too, was sunk. Scientists and engineers went quietly back

[281] Kenneth Kostel, email to author, October 24, 2017.

to work, developing *Nereid*, the next generation of submersible, all the while keeping the public out of the process and out of the story.

This event provided a motivating force for OMI to fill a niche and to "boldly go" a bit deeper in terms of the popularization and communication of science, picking up where the scientific organizations were perhaps not free to venture themselves due to varying institutional, funding, or otherwise bureaucratic constraints. As the Ocean Media Institute operates entirely independently, it affords us the opportunity to engage as an outreach partner that benefits and amplifies the work of all parties involved.

In 2015, OMI collaborated with Woods Hole Oceanographic Institution (WHOI) and the Alucia Foundation to send Brett Kuxhausen, an emerging filmmaker, to Panama on an expedition to explore a seamount off the coast of Coiba (figure 25). Kuxhausen engaged with the research team (even riding in the submersible, himself), took extensive photographs, made three short films highlighting each week's research activity and also produced an 8-minute piece. OMI mentored Kuxhausen through the process, providing feedback on cuts of his films and also produced a website to highlight the project.[282]

[282] See OMI's page on Brett Kuxhausen and the Panama Expedition at oceanmediainstitute.org/hannibal.

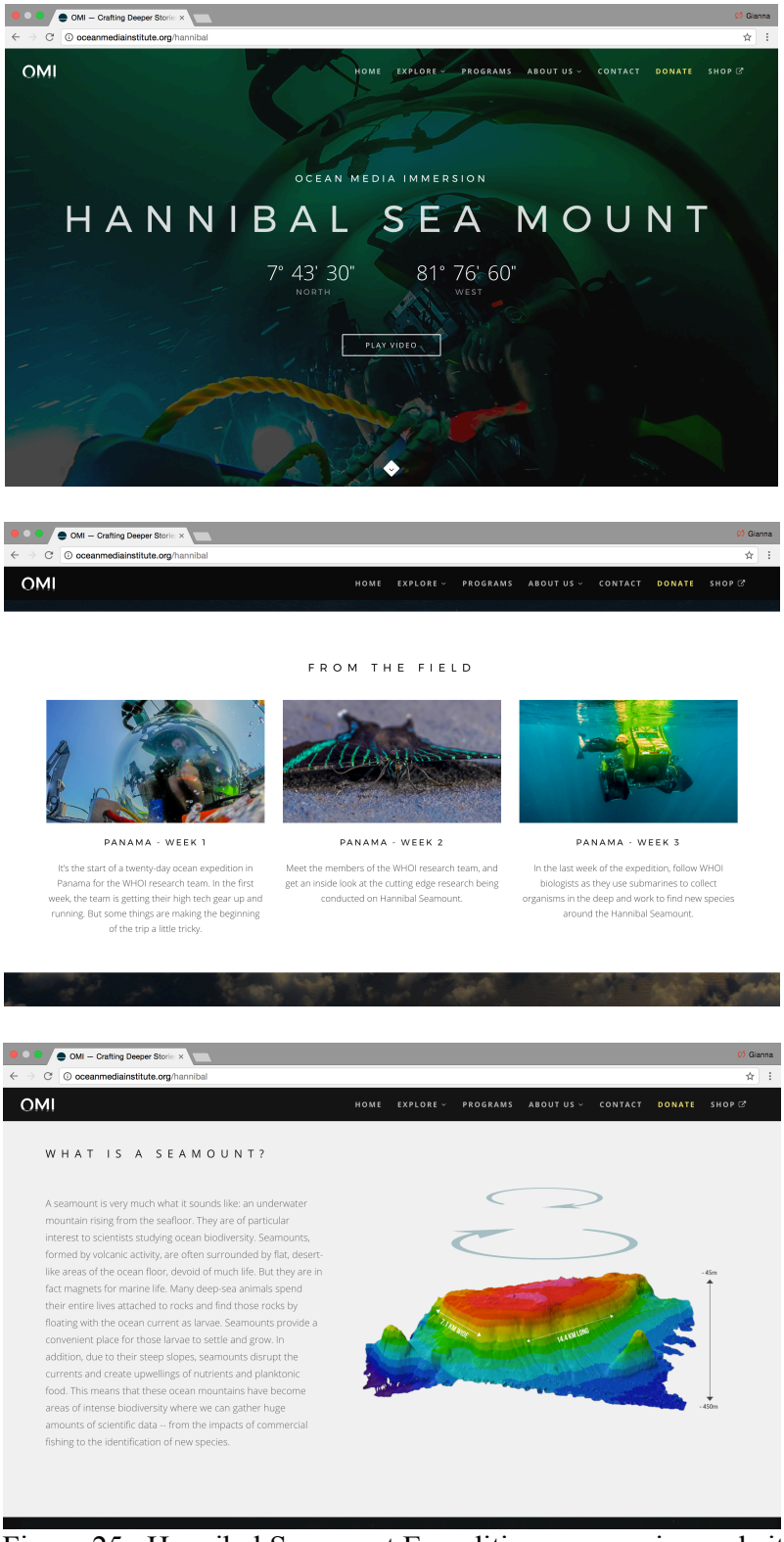


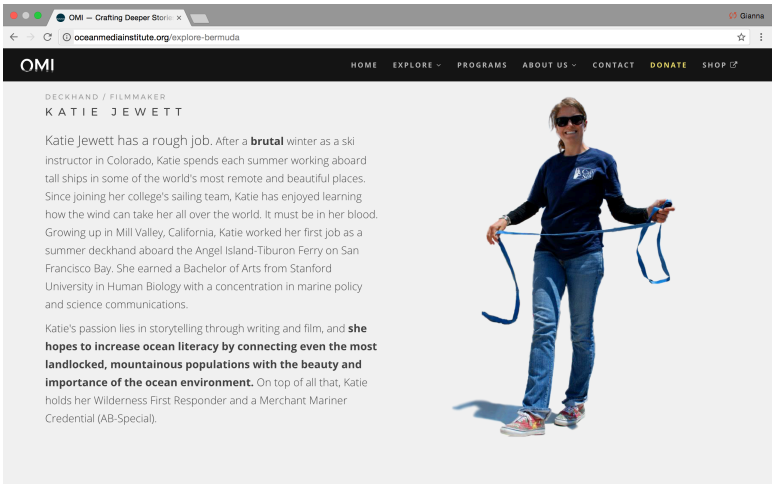
Figure 25. Hannibal Seamount Expedition, companion website. Copyright 2016, Ocean Media Institute. *Source:* Ocean Media Institute.

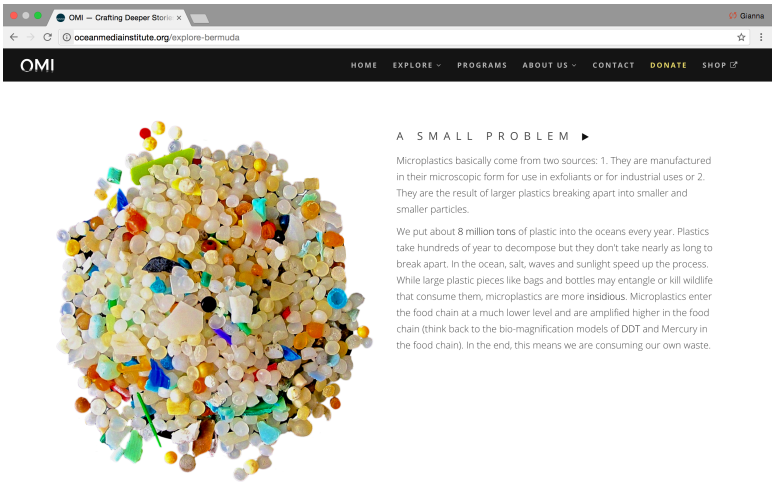
All of Kuxhausen's media was used for educational purposes by WHOI and Alucia and distributed to those in OMI's partner network, including PBS Learning Media, which reaches over one-million teachers nation-wide through its online video portal. We are also creating curriculum to accompany the videos and further invest the kids in the science. In addition, WHOI repurposed some of the media including one short clip of a crab swarm that went viral. Erin Koenig, WHOI's Media Relations Coordinator stated to me in an email: "The response has been HUGE! The crab swarm short clip has gone viral and people are also loving the longer piece featuring the gorgeous footage shot by Brett . . . He really did an amazing job!"[283] As OMI employs a model of open distribution, meaning the media created is openly available and shared freely, we can enjoy a much farther reach than if the media was used by only one entity.

Katie Jewett, another of our Ocean Media Explorers, sailed between Bermuda and the Azores aboard Pangaea Exploration's vessel, *Seadragon* to document an ocean plastics expedition with Boyan Slat, the young environmental innovator and CEO of the Dutch organization, *The Ocean Cleanup* (figure 26). Like Kuxhausen, Jewett also created three short videos under my mentorship and combined them into a longer twelve-minute piece that was distributed by OMI and *The Ocean Cleanup*.[284] That film went on to become a finalist at the 2016 BLUE Ocean Film Festival, screened to hundreds of school kids and other members of the public, and was featured as a film for the 2017 Blue Ocean Film Festival's World Ocean's Day Event in St. Petersburg, FL.

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[283] Erin Koenig in email to author, April 15, 2016.
[284] See OMI's page on Katie Jewett and the Bermuda Plastics Expedition at oceanmediainstitute.org/explore-bermuda.





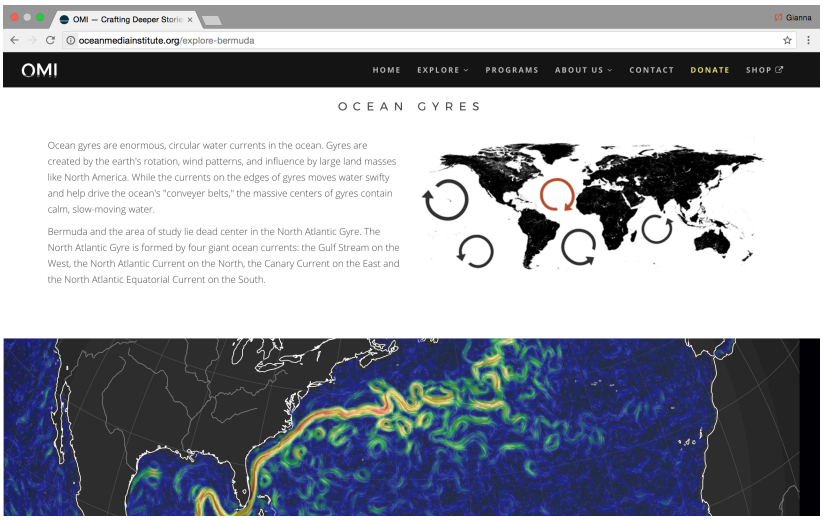


Figure 26. Bermuda Plastics Expedition; Companion website. Copyright 2016, Ocean Media Institute. *Source:* Ocean Media Institute.

Some of Jewett's footage from the expedition was also licensed for use in a documentary called, *Der Junge und das Meer* ("The Boy and the Sea") (2015) by Achtfeld GmbH, a German production company, and for use by Bermuda's governmental television station operated by the Department of Communication and Information. In addition, her footage has been incorporated into ocean conservation pieces by the British organization, Pangaea Exploration and into media for the California Academy of Sciences, where Jewett now works as part of the communications team.

The *Ocean Media Explorer* program established a brand new model for collaboration among the scientific, production, and educational entities and is emerging as one of OMI's most popular initiatives. Further, as the media created is openly distributed, we have the ability to reach myriad demographics and expand narrative ownership.

OMI Focus Area 3: Creative Communication: *I Am Ocean*

This is where I feed my family. This is where my children grow. This is where we live . . . It's all because of the ocean. This is my treasure. This is the best blessing for me, that we have ocean. (Jong Avani)[285]

Throughout my two-decade tenure in the industry of science and natural history filmmaking, I have been involved in dozens of productions that serve to tell another's story, whether human, wildlife, or a landscape. Having worked for such broadcasters as PBS/NATURE, National Geographic, Discovery, Animal Planet, the BBC, and others, I

[285] Jong Avani, a Bajao fisherman in the Philippines, interviewed by Jeff Reed on location for *I Am Ocean: Philippines,* March 2016.

have witnessed first-hand some of the common pitfalls of environmental storytelling. Far too often, environmental films barrage the audience with a litany of scientific facts, statistics, and scare tactics rather than engaging on an emotional level that leads to empowerment. One question I posed in the survey I conducted read:

> Over the past year, most environmental films I have watched have left me feeling. . .
>
> a) Empowered to take action
> b) Encouraged that there is hope, but not moved to act myself
> c) Apathetic
> d) Discouraged to the point of feeling helpless to act
> e) I can't even watch -- it's too depressing
> f) Other

Only 30.1% of respondents felt empowered to take action, while options b) and d) fell in close behind, suggesting that there is a fine line between motivating and overwhelming the viewing public (see figure 27).

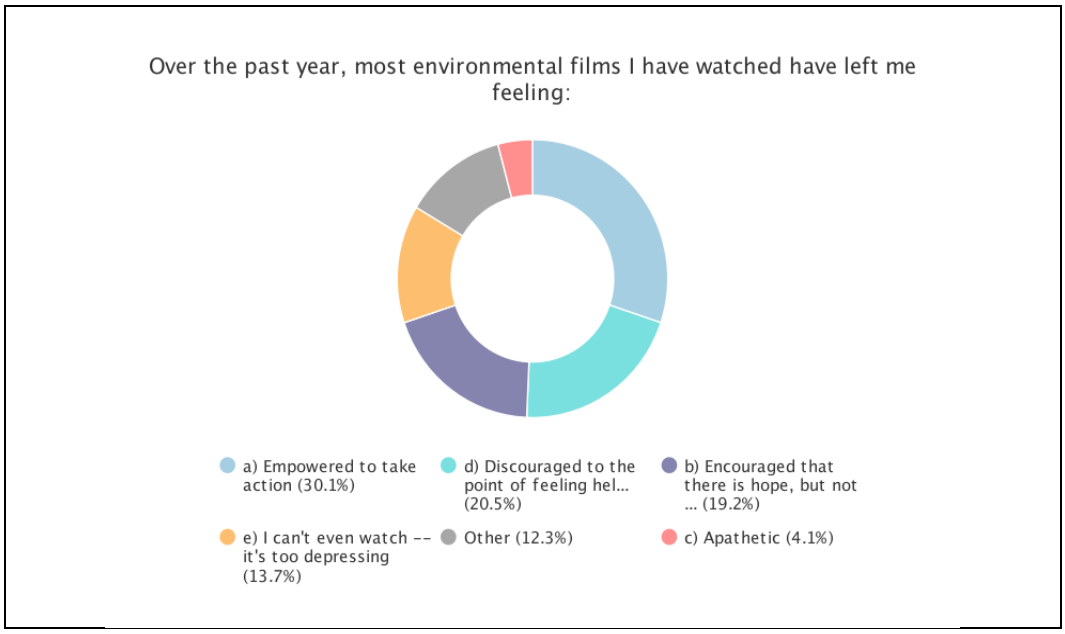


Figure 27. Survey 3 results from "Turning the Tide: Movie to Movement" online public survey, conducted by author, June, 2017. *Source:* Author.

The point of view through which an audience enters a story dictates how their relationship with the subject will evolve. As I have stated in a previous chapter, popular science and natural history documentaries have utilized (and still do to a great extent) the "Voice of God" narration; a faceless, authorial commentary that relays the story the producer wants to "tell." The problem is that it tends to create a gulf between viewer and subject. Knowledge is gleaned via an unseen third party whose primary role is to dispense information as efficiently as possible, not to convey his or her own personal connection to it. "As described by countless critics, the voice-over has, in recent decades, been deplored as dictatorial. . ." writes Michael Renov in *The Subject of Documentary.* ". . . it imposes an omniscience bespeaking a position of absolute knowledge."[286] Though it is fast-becoming an outmoded style of storytelling in other areas of documentary, "Voice of God" narration still commands the genre of science and natural history film.

If there is one piece of advice I convey to my students as a mantra, it is to never tell your audience what to think; instead, lead them to feel. As Cousteau has shown us, if a filmmaker can emotionally invest their audience in the subject, it is far more likely they will be moved to action. The way to do this most effectively is by establishing empathy with a character. Most respondents (56.8%) to my survey stated that films that employed empathy were most effective in their messaging. Though many environmental films employ guilt, sadness, or outrage as a tactic, these scored extremely low. Only 2.7% or less of respondents found them effective as motivators (see figure 28).

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[286] Michael Renov, *Subject of Documentary: Visible Evidence* (Minnesota: University of Minnesota Press, 2004), xxi.

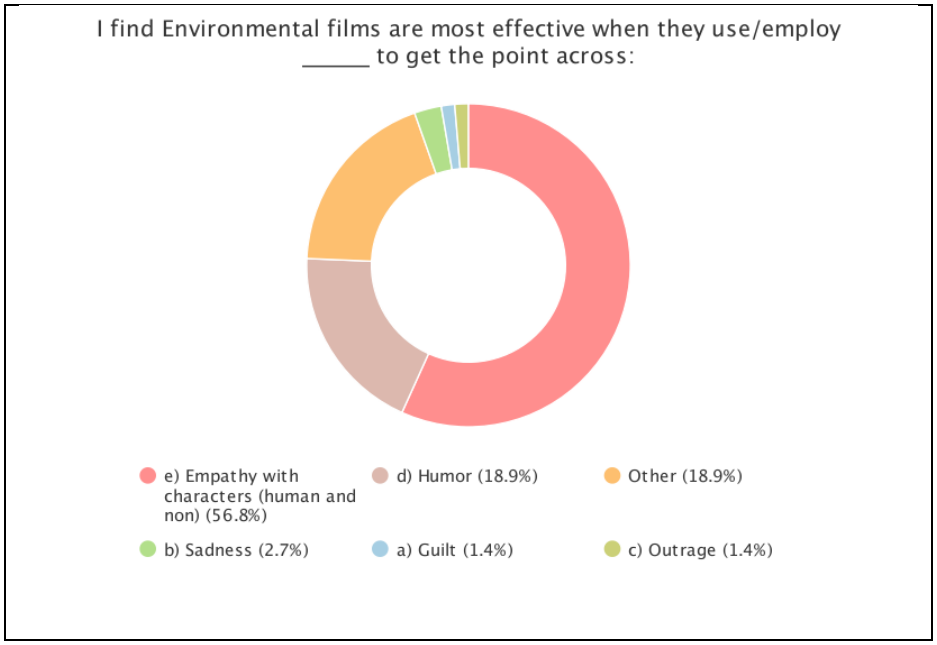


Figure 28. Survey 4 results from "Turning the Tide: Movie to Movement" online public survey, conducted by author, June, 2017. *Source:* Author.

Some of the most successful documentaries in terms of impact are those that "illuminate the human experience. Films can bring audiences inside stories and communities that they might not otherwise be familiar with, provoke dialogue and inspire people to take action."[287] And to do that, we need to get personal.

A recent study by a group of neuroscientists looked at hormonal release in participants who were asked to watch short PSAs. The results showed a correlation between the emotional stories and oxytocin release, which is associated with empathy for the story characters. The results suggest that stories that connect an audience to a

[287] Inspirit Foundation, "Documentary Impact: Social Change Through Storytelling." *HotDocs.* 2014, 6, accessed May 23, 2017, http://s3.amazonaws.com/assets.hotdocs.ca/doc/HD14_Documentary_Impact_Report.PDF Web.

character on a personal level are more likely to lead to investment by the audience.[288] Further, personal stories that convey emotion help to advance the conversation on polarizing issues such as climate change, because "people 'take sides' on an *issue*, but it's much harder to 'take sides' on a *story*."[289]

Building on these studies and returning to the idea of accompaniment, I have developed OMI's signature initiative, *I Am Ocean,* a widespread global campaign that serves to cast a spotlight on the health of the world's oceans through short films of those we seldom hear from, yet whose lives are deeply impacted by each ebb and flow. This flagship project of the Ocean Media Institute serves as a cross-cultural bridge through the powerful tool of digital media. From Inuit fishing families in the Alaskan arctic, to net builders on the coast of Mozambique, to oystermen eking out a living in the Gulf, we parallel American lives with those in far reaches of the planet, weaving together stories of people whose lives on the surface seem worlds apart, yet are threaded together by the same undercurrent.

In coastal regions around the world, environmental health is interlaced with cultural health and when one erodes, so does the other. *I Am Ocean* offers an interactive platform for people living in communities perched precariously on the cusp of colossal change to candidly share their views about their ocean environment -- what they love, what they fear, what they value and dream about protecting. We pair stunning cinematography with a participatory approach, enabling our characters to share their story

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[288] Paul Zak, "Why Inspiring Stories Make Us React: The Neuroscience of Narrative," *Cerebrum* (November 2015), 6.
[289] Paul Van de Carr, "Assessment of Beyond the Choir," *Active Voice Lab, Community Initiatives* (May, 2014), 4.

through their eyes. Drawing on the power of their own voice, these dynamic storytellers provide a glimpse into life in their region and their personal connection to the ocean as only they can.

These are not biographies or profiles of people, but rather "video postcards" of individuals sharing their personal connection to their ocean region in their own words. The people featured in the videos are diverse -- ranging widely in experience, education, race, culture, political and religious affiliation and socio-economic background. Whether a coral scientist in Florida, a Bajao fisherman in the Philippines, an indigenous spiritual leader in Hawaii, or a seabird specialist in the Arctic, this project creates an interactive bridge across oceans, cultures and demographics, connecting people across the globe and empowering them to draw on the power of their own voice to share their stories.

Working intimately with members of community throughout all ocean regions, we are building a transmedia campaign that includes a series of three- to five-minute video postcards, audio podcasts, and photo essays that are to be distributed through OMI's digital partner network, while providing a template for an interactive exhibit for U.S. based museums and aquariums. We are also incorporating a storytelling workshop with the communities in order to pay it forward and expand the collective narrative.

We initiated *I Am Ocean* with our pilot project, *I Am Hawaii* (2016), through which we produced three video postcards including that of Chad Wiggins, a coral scientist who works for The Nature Conservancy; George Fry, the president of the Kawaihae Outrigger Canoe Club; and Pua Case, a native Hawaiian spiritual leader and activist. The short films, available for viewing on our website, have enjoyed vast

reach.[290] They are being distributed through PBS Learning Media and our network partners and have been featured as award-winners in multiple film festivals across the globe, including the Reef Renaissance Film Festival in the Virgin Islands, Blue Ocean Film Festival in Florida, Les Bois Film Festival in Idaho, Waimea Film Festival in Hawaii, International Wildlife Film Festival in Montana, Amore Film Festival in Croatia, Ethnografilm Paris, and EKOtop Film Festival in Slovakia.

Though all three of our *I Am Hawaii* videos have been successful, *I Am Ocean: Pua Case* has been our most popular to date.[291] I introduced Pua in Chapter One through my work on *Our Blue Canoe.* As a mother and teacher, chanter and dancer, cultural practitioner and activist, she is a quintessential storyteller -- and her lessons run deep. Raised by her grandmother in Waimea on Hawai'i Island, she knows intimately of the relationship her people shared with the land and the sea. From the summit of Mauna Kea to the depths of the Pacific Ocean, Pua's profound connection to both fuels her passion, shapes her prayers, and ignites her belief that a deeper understanding of "home" will restore our natural balance with the environment. In this short film, she explores her personal journey from ocean to mountain and back again.

In producing these videos, we lean heavily not only on the words spoken by our participants, but on imagery, sound design, and music, all to generate an emotional connection that cuts through. Naturally, not every piece will impact every viewer, but by

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[290] To watch the *I Am Ocean: Hawaii* films on OMI's website, visit OceanMediaInstitute.org/IAmHawaii.

[291] See Facebook Insights, *"I Am Ocean: Pua Case,"* Ocean Media Institute Videos, accessed June 5, 2017, https://www.facebook.com/oceanmediainstitute/insights/?section=navVideos.

including a vast array of voices of those who are connected to their ocean region for different and sometimes disparate reasons, and refraining from inserting our own voice, values or belief system onto the videos, we allow for greater access. It is my hope that our audience will be able to tap in and find something of themselves reflected in those who share their stories.

In addition to the *I Am Hawaii* series, we have also produced an *I Am Ocean: Philippines* series (currently being edited) and are now in the process of expanding the program to work with individuals and organizations in Mexico, Mozambique, Maine, Florida, Cuba, the Alaskan Arctic, Myanmar, Senegal, Belize, Costa Rica, Baja, and the Galapagos. We have also received interest in expanding *I Am Ocean* into interactive exhibits at the Florida Aquarium and MOTE Marine Lab, Imiloa Astronomy Center in Hilo, Hawaii, and the Oregon Museum for Science and Industry in Portland, Oregon.

My motivating factor for initiating *I Am Ocean* is to create a collective narrative of these ocean regions by exploring the ways in which each ocean region is unique, yet interconnected. We do this through the myriad personal connections to each location that hopefully transcend the place itself. One aspect of the project is to create an interactive map so that viewers can learn about different ocean regions through these personal stories in a way that is not preachy, nor pedantic, but intimate and relatable. Each *I Am Ocean* story acts as a mosaic piece that when assembled, creates a cohesive portrait of the world's ocean regions. As each tale unfolds, we'll come to see reflections of ourselves in each storyteller and through them, gain new clarity as to just how intricately woven *all* of our lives are with the ocean, no matter where we live. At its heart, *I Am Ocean* taps into

our humanity by providing a unique entry into each other's lives, asking us to look and listen deeply, and reinforcing those connections that run deeper than we think.

Getting Our Feet Wet

This chapter has served to introduce the Ocean Media Institute, the organization I founded as an outgrowth of this dissertation. Through our goals of collaboration, education and the creation of openly distributed media, I am hoping to expand the public's understanding and engagement in ocean science in a way that will foster a collective narrative history with our ocean in service to its protection. As OMI is in its infancy and has only just begun to sprout its fins, I am certain that the programs I have initiated will continue to evolve along with America's relationship with the ocean. No matter the shifts to come, one key component that I am certain will remain inherent to every one of our initiatives and programs is that which I identified in my introduction: accompaniment. And with that, I look to OMI's role in the future.

My hope is that OMI will continue to grow and serve as model for other environmental organizations to work collaboratively and to use the power of story to advance their mission, include the public in their narratives and pay their work forward to others. To realize this, we are currently developing a workshop series especially designed for science and conservation practitioners to enlighten them on the power of storytelling and what it takes to create engaging, impactful visual media. We also hope to expand the *I Am Ocean* program and draw from its alumni to establish a core of ocean media ambassadors that will continue OMI's work in their particular region of the world,

tailoring the program to address the specific ocean issues related to them. We also plan to pay it forward with those who have passed through our Ocean Media Explorers program, having them teach the scientists in their communities how to create compelling media. Everything produced will be shared via OMI, our partners, and the scientists' contingent, thus expanding the reach of the science exponentially. We are also expanding our Mountain Mermaids and Mermen program to other inland states, including Idaho and Wyoming. We are sharing our curriculum and resources with teachers so they can implement it in their schools and tailor it to include a community action project relevant to their location.

Never before has there been a greater need for strong, committed storytellers in the domain of the sciences and I am excited for the potential of OMI to secure a better future for our ocean. Developing strong science storytellers serves to foster a deeper connection to the important natural resources on which our communities depend for health, happiness and even livelihood. In our mission to advance science storytelling, we are ensuring that this skill will come back to benefit the ocean, and by extension, us as humans in a significant way.

CONCLUSION

TURNING THE TIDE

We are like islands in the sea, separate on the surface but connected inthe deep. (William James)[292]

Since the dawn of humanity, we have relied on story to make sense of our world. Stories provide the context for experience, whether our own or that of others, and we elucidate meaning and form connections through the way they are told. It is a dynamic in which the narrator wields immense power, as the storyteller alone possesses the agency to shape an experience, and thus our relationship, with a subject. "Storytelling engages the eye, the ear and the soul," states Valerie Redhorse, Cherokee Sioux filmmaker and actress.[293] It has the power to change, influence and create understanding by activating all the senses and emotions. Throughout this dissertation, I have asserted the power of a story is rooted in its imagery. Long before our human ancestors were drawing or writing or recording our stories in some other way, they were passing down knowledge through vivid descriptions that had relevance to our lives, our community, our culture. Through

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[292] This quote is commonly attributed to William James, but it is an abridged version of his words, "We with our lives are like islands in the sea, or like trees in the forest. The maple and the pine may whisper to each other with their leaves. … But the trees also commingle their roots in the darkness underground, and the islands also hang together through the ocean's bottom." See "Confidences of a 'Psychical Researcher,'" *The American Magazine*, 68 (1909): 589.

[293]"Native Storytellers Connect the Past and the Future," Native Daughters website, University of Nebraska, Lincoln, accessed November 18, 2017, http://cojmc.unl.edu/nativedaughters/storytellers/native-storytellers-connect-the-past-and-the-future.

the act of listening, we were able to see powerfully enough through the spyglass of our past to envision and build a future.

In terms of the story of the ocean, that experience has been relatively passive for most of our Western history as we have been primarily on the receiving end of a variety of narratives that have been exposed to us through the lenses of others -- lenses belonging predominantly to those of white European descent. From images conjured through tales we read or were told, to those that were presented to us by artists, photographers and filmmakers, the story of the ocean we chose to claim for ourselves, has never been fully complete or ours to fully participate in. And perhaps because of that, there has remained a disconnect with the sea that has compromised our relationship with it.

This dissertation has been my attempt to contextualize our storied understanding with the sea in order to shape a history with it -- as Americans, as Westerners, as Indigenous people, as citizens of this blue planet. As I have explored throughout these pages, we have watched the ocean take shape in the American psyche and settle for just a bit through the works of writers and artists, historians and scientists, before packing up and relocating again. The story of the ocean is in constant motion. But this movement does not signify abandonment; it represents evolution. We have constructed a relationship with it through shifts in imagination, shifts in focus, shifts in culture, shifts in ways of seeing, of knowing, of understanding. The terrifying realm of monsters that was presented to us in mythology is just as important to its story as the mapping of the sea floor or the discovery of a new species. We have not discarded and replaced elements of the story of the ocean; we have simply built upon them and expanded their meaning.

And residing in that realization is the revelation I have made: in my attempt to chronicle the story of the ocean over time, I have discovered that its story is not linear, it is not temporal; it is textured. The narrative of the ocean has no arc with a beginning, middle and end. It moves. It pulses. It swells. It is music.

We must also consider history in this context, and understand that it, too, is textured. I make no claim to be a historian; I am a documentary storyteller. But it is evident to me that history, like documentary film, is a collection of moments strung together and layered to create a composite. The way we choose to interface with it as individuals, as a community, as a culture, establishes what we call legacy. That legacy *is* our collective narrative.

I have used Helen Rozwadowski's thesis that we can only come to know something when we share a history of it as a launching point to argue the need for the public to become part of a collective narrative of the ocean in order to protect it. And this requires crafting a story of the science that engages our humanity. I posit that we can only do that when we reimagine the methodology of our science and the communication of it. When we consider science, we (as Westerners) tend to do so in terms of objective, empirical, evidence-based information. Science communication, on the other hand, tends to be viewed as subjective, opinion-based, and value-laden. Objectivity and subjectivity are often viewed as antithetical, but this is a binary that won't survive the twenty-first century because science without the argument for it is meaningless. Through our various disciplines, we have boxed ourselves into language that, in this digital age, has become

quaint and inhibits our ability to move across camps and expand scientific discourse in potent and practical ways.

My work via the Ocean Media Institute is a call to rethink this binary and looking at the place where science and science communication overlaps, where objectivity and subjectivity entwine, where Western and Indigenous approaches mingle. In that shared space resides "narrative responsibility." There is an ethos inherent to both science and science communication to relay the science in a way that is factual, accessible and inclusive so that it that benefits all society. I have introduced the concept of narrative ownership, a term oft-used by filmmakers in shaping "their" story, and have called for us to question the territoriality embedded in its meaning and embrace a more collective approach.

In examining the role of media in forging divergent messages for diverse audiences, we must look deeply at the landscape in which it occupies. In Chapter Two, I chronicled the work of William Beebe, Rachel Carson and Jacques Cousteau and offered that for all the good they did in popularizing ocean science and igniting public interest in the story of ocean, they did little to in fact move the needle in terms of the sea's protection. I posit there were two reasons for this. First, all three embraced a diffusionist approach which employed a deficit model of science communication, assuming if they did their part to "enlighten" the lay public, action would follow. As I discussed, this model is an outmoded concept, proven to have limited effect. Secondly, though all three of these popularizers had intended to reach a "mass audience," they were in fact, accessing a limited demographic and neglecting a range of voices that may have offered a

broader resonance with their message. Though it is easy to be critical of the communication tacks of fifty or more years ago, it is important to view the reach and impact of their work in terms of the media landscape they traversed at the time and recognize they were bound by the edges of those maps.

We now inhabit a world very different than that of Beebe, Carson and even Cousteau. Today, the rapid expansion of digital media has created a shifting terrain that is ever fracturing and fissuring. There is no longer any such thing as a "general audience." But that is not necessarily a detriment to science communication; on the contrary, expanding boundaries so expands the ability for active and inclusive messaging. Scientists and media makers now have the ability to target their audience and craft their narrative in a way that reaches and engages them far more directly. Further, current technology allows scientists and science communicators to pair their message with outlets for direct action, something that was not plausible until the digital revolution.

I made the argument in Chapter Three for scientists to enter the social media realm and share the story of their science with the public. Over the course of the past decade, people from virtually every corner of the world and walk of life have managed to "connect" in this arena in a way that is at the same time anonymous, yet intensely personal via social networks such as Facebook, Twitter, and Instagram. The Facebook "community," at more than two billion strong, is built upon a multiplicity of avatars in which the performance of an individual (i.e. storyteller) is inherent. Those who are a part of this culture engage in a form of exhibition every day -- even scientists. Identities take shape, and are constantly reshaped, by others who "like," comment, or otherwise respond

to their performance. In discussing the construct of community in her book, *95 Theses on Politics, Culture, & Method,* cultural historian Anne Norton writes, "The individuals who join the community are made at once more general and more specific. Each is part of the community and apart from it."[294] In the virtual world of social media, relationships between community members appear tenuous and superficial. So why should scientists engage? The answer to that lies in the power of the collective identity that is established therein. Collective identity is by no means a new concept; sociologists have been studying the phenomenon for decades. At its most basic definition, it is the shared sense of belonging to a group. Sociologists Francesca Polleta and James Jasper define it as an individual's cognitive, moral, and emotional connection with a broader community, category, practice, or institution.[295] The collective identity of a community has proven to wield enough power to generate and sustain cohesion and commitment among participants. This perception of a shared status or relation often leads to solidaristic behavior that transcends the "virtual." Norton wites, "As the individual becomes conscious of the likeness to the community, the individual also becomes conscious of those traits that preserve individuality."[296] In this sphere, the strength of each individual

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[294] Anne Norton, "Thesis 34: Community Entails Alienation," *95 Theses on Politics, Culture, & Method* (New Haven and London: Yale University Press, 2004), 60-61.
[295] Francesca Polleta and James M. Jasper, "Collective Identity and Social Movements," *Annual Review of Sociology* 27 (2001): 283-305. For more on Collective Identity, see Owen Whooley, Collective Identity, *The Blackwell Encyclopedia of Sociology* (Hoboken, NJ: Wiley-Blackwell Publishing, 2007), 46; see also Kathryn Ranney, "Social Media Use and Collective Identity Within the Occupy Movement" (Master's Thesis, University of Hawaii at Manoa, 2014), accessed November 22, 2017, https://scholarspace.manoa.hawaii.edu/bitstream/10125/101130/1/Ranney_Kathryn_r.pdf
[296] Ibid.

emerges and bolsters the community at large. Sociologists Bruce Fireman and William Gamson write,

> A person whose life is intertwined with the group [through friendship, kinship, organizational membership, informal support networks, or shared relations with outsider] . . . has a big stake in the group's fate. When collective action is urgent, the person is likely to contribute his or her share event if the impact of that share is not noticeable.[297]

In other words, acting in service to the "greater good" is of utmost importance to the individuals of a community. In terms of social media, we have witnessed the power of collective identity manifest in concrete and quantifiable results. One such example is the "Blackfish Effect," which refers to the impact of the social media campaign that formed in the wake of the feature documentary film, *Blackfish* (2013). The film shed a light on the plight of whales in captivity by using the story of SeaWorld's killer whale, Tilikum, who was responsible for the 2010 death trainer Dawn Brancheau, as a centerpiece. Public outrage spurred the formation of an online community a half-million strong and generated enough public pressure that led to an eighty-four percent drop in SeaWorld's profits and the end of their captive breeding of orcas.[298] The film alone could

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[297] Bruce Fireman and William A. Gamson, "Utilitarian Logic in the Resource Mobilization Perspective," *The Dynamics of Social Movements* (Cambridge, MA: Winthrop 1979), 8-44.

[298] See Lori Weisberg, "After the 'Blackfish Effect' SeaWorld Turns to New Wave of Exhibits, Shows," *Chicago Tribune,* May 30, 2017, accessed November 24, 2017, http://www.chicagotribune.com/lifestyles/travel/ct-orca-encounter-seaworld-20170530-story.html; see also Beatrice Verhoeven, "'Blackfish Effect': SeaWorld Suffers Disastrous 84 Percent Drop in Profits in Wake of Documentary," *The Wrap,* August 6, 2015, accessed November 24, 2017, https://www.thewrap.com/blackfish-effect-seaworld-suffers-disastrous-84-percent-drop-in-profits-in-wake-of-documentary/; see also Katrina Valera, "How Social Media Fueled the Blackfish Effect," School of Communication, Drury University, February 12, 2015, accessed November 22, 2017, https://dusocialmediastrategy.com/ 2015/02/social-media-blackfish/; see also Caty Borum

not have led to this result, nor was it the intention of the film's producer and director, Gabriela Cowperthwaite. "I set out to understand this incident," she writes in an article for *CNN,* "not as an animal activist -- because I'm not one -- but as a mother who had just taken her kids to SeaWorld, and of course as a documentary filmmaker who unfortunately can't let sleeping dogs lie."[299] Cowperthwaite had no idea the reaction to the story would be so strong, let alone lead to change in SeaWorld's policy. Her goal was in line with my mantra that I discussed in Chapter Four: "Never tell your audience what to think, lead them to feel." For Cowperthwaite, the role of the film was to craft a narrative that was scientifically factual and engaging -- the rest would be left up to the audience. "I don't know if it will change the way you feel about animals in entertainment parks. I didn't intend for it to do so," she states. "I just wanted to tell the real story. And I trust that once audiences are armed with the truth, they will make the best decisions by themselves and their families."[300] It was not the film itself that generated change; it was the community that formed apart from the film that carried the strength to create measurable impact. It is an approach in direct contrast to the diffusionist method of the likes of Beebe, Carson, and Cousteau. Instead of the storyteller "owning" the narrative for a select audience, narrative ownership is instead relinquished so that it may be

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Chatoo, "Breaking Down the Impact of Blackfish," Center for Media and Social Impact, American University, accessed November 22, 2017, http://cmsimpact.org/social-impact/breaking-down-the-impact-of-blackfish/; see also Greg Allen, "SeaWorld Agrees To End Captive Breeding Of Killer Whales," *NPR,* March 17, 2016, accessed November 22, 2017, https://www.npr.org/sections/thetwo-way/2016/03/17/470720804/seaworld-agrees-to-end-captive-breeding-of-killer-whales.

[299]Gabriella Cowperthwaite, "Why I Made Blackfish," *CNN,* October 28, 2013, accessed November 24, 2017, http://www.cnn.com/2013/10/23/opinion/blackfish-filmmaker-statement/index.html.

[300] Ibid,

adapted and reshaped for the collective purpose. The Social Network has become the technical turf on which the collective identity can play out and effect change, populated by individuals bound by common truths.

I have discussed the pliability of the meaning of truth in terms of relevance to a person's life or to their community. "Truth is verifiable to the extent that thoughts and statements correspond with actual things, as well as the extent to which they 'hang together,' or cohere, as pieces of a puzzle might fit together," writes William James. "These are in turn verified by the observed results of the application of an idea to actual practice.[301] James held a pragmatic worldview that espoused the idea that the value of any truth was reliant upon its usefulness to the person who held it. He saw the world as a mosaic of diverse experiences in constant motion and that could never be halted for an entirely objective analysis. "The mind of the observer and the act of observation affect any empirical approach to truth," he claimed.[302] The central point of James' precept of "truth" is that truth emerges from facts, but is not fixed and in a constant state of flux. "They dip forward into facts again and add to them; which facts again create or reveal new truth (the word is indifferent) and so on indefinitely. The 'facts' themselves meanwhile are not true. They simply are. Truth is the function of the beliefs that start and

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[301] William James, "Pragmatic Theory of Truth," *Encyclopedia of Philosophy, Vol.6* (New York: Macmillan, 1969), 427–28.

[302] See William James, "Defense of a Pragmatic Notion of Truth," written to counter criticisms of his 1907 lecture, "Pragmatism's Conception of Truth," in *Pragmatism and Other Writings*, edited with and introduction and notes by Giles Gunn, Penguin Classics edition (New York: Penguin Group, 2000); see also James Sloan Allen, *William James on Habit, Will, Truth, and the Meaning of Life* (Savanna: Frederic C. Beil, Publisher, 2014).

terminate among them."[303] We have seen both utility and abuse of the role of truth in our science discourse. It has been used to bolster arguments for stauncher protections, as well as having been bent and twisted to achieve corporate and political gain. In my view, it is the obligation of truth, in all its malleability, to serve science. There is a fine, yet definitive line between reinforcing and replacing. Truth should add dimension, nuance and meaning to science. It should never diminish it. This is at the heart of narrative responsibility in science communication.

Narrative responsibility also means bringing in perspectives of those who are an essential part of the story, not by way of ownership or appropriation, but of collaborative partnership. In that spirit, I have made an appeal for the addition of Indigenous perspectives in the role of science and science communication. In terms of Western science, developed in Europe over the past century and a half, the system of knowledge is based upon a scientific method that calls for testing hypotheses which, when proven, yield theories or "truths" about the world. These truths, as we have explored, relate to certain values that are not necessarily objective. They are the building blocks of the story of the science.

There has long been a general distinction between Western science and Indigenous knowledge. Western science focuses on the component parts whereas Indigenous knowledge presents information about the world in a holistic way.[304] There are instances when science incorporates aspects of Indigenous knowledge but only when

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[303] James, *Pragmatism,* Thomas Crofts and Philip Smith, eds. (Mineola, NY: Dover Publications, 1995), 108.

[304] See "Living Knowledge: Indigenous Knowledge in Science Education," accessed Dec 2, 2017, http://livingknowledge.anu.edu.au/html/educators/02_questions.htm.

it meets the criteria of Western science. Generally, however, Indigenous knowledge does not fit the criteria for science and therefore is classed as a different kind of knowledge. [305] As I have explored, the environmental issues of today are multi-faceted and have cultural and social implications. There is no "one size fits all" or isolated system of knowledge. Crafting solutions that draw on perspectives other than Western science would therefore be beneficial. There is no doubt that Western scientific applications are required to solve our problems with the ocean, but I believe the addition of Indigenous knowledge would serve to compliment and strengthen that science.

The time I spent with the Pacific Voyagers challenged me to question how we come to "know" the ocean and provided me with a different lens in which to view my own relationship with it. Over the course of the three years that I worked on *Our Blue Canoe,* the story of the ocean changed for me as new "truths" were revealed, new lessons were learned, and new ways of experiencing it were discovered. I didn't assume my Pacific friends' identity or culture, I didn't replace my previous knowledge with theirs; I simply added other layers of knowing to my own historical foundation.

When viewing the story of the ocean through the lens of American Studies, we find its reflection in movement that provides grounding to the ever-evolving phenomenon that is the American Experience. Since 1507 when, for the first time, a map bore a strange new continent on which a strange new name appeared: "America," this nation has been in motion, constantly re-inventing itself.[306] The narrative of America as a work in

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[305] Ibid.

[306] For scholarship on the concept of America as invention, see for example, Richard Pells, *Not Like Us: How Europeans Have Loved, Hated, and Transformed American*

progress is inherent to its identity as a deeply diverse and pluralistic society. The many cultures, races, religions that comprise this country constitutes an American Experience that is in constant flux. It seems the rule of America is to break its own rules in order to progress. It is what separates us as individuals that, paradoxically, binds us as a nation.

Yet, for all the richness that the story of the sea has to offer American Studies, the field boasts very little ocean-oriented scholarship. It was surprising to me as I embarked on my research, to find very few articles in *American Quarterly* even loosely related to my work. An article titled, "Moby-Dick and American Political Symbolism" appeared over half a century ago.[307] Aside from that, I could only find one Special Issue that was ocean-themed. The issue called, "Pacific Currents" was a volume dedicated to Native Pacific Studies and contained articles that explored areas of Pacific Island Culture, Imperialism, and Geopolitics.[308] Nowhere could I find articles relating to ocean science or science communication in the journal. It is my hope that this dissertation serves to add to the breadth of scholarship in the field and expand it in a way that allows for inclusion of topics and voices previously reserved for more distinct camps. It is time for American Studies to do the work its work claims to do by truly embracing their interdisciplinary philosophy by making room for scientists, science communicators, and other ocean scholars to contribute.

Culture Since World War II (New York: Basic Books, 2007); see also Greil Marcus and Werner Sollers, *A New Literary History of America* (The Belknap Press of Harvard University Press, Cambridge, MA and London, England, 2009); Maddox, Lucy, ed., *Locating American Studies: The Evolution of a Discipline* (Baltimore, MD, The Johns Hopkins University Press:1999).

[307] Alan Heimert, "Moby-Dick and American Political Symbolism," *American Quarterly* 15, no. 4 (Winter, 1963), 498-534.

[308] "Pacific Currents," a Special Issue of *American Quarterly* 67, no. 3 (September 2015).

As Tominson and Lipsitz write, “This is no ordinary time for American Studies. It has never been more difficult—yet never more important to explain how the abstract idea of 'America' works in the world."[309] This is where the idea of accompaniment becomes essential to the work I do as an individual and to the role Ocean Media Institute will play in advancing the field of American Studies. As an organization that employs a collaborative approach in drawing together the visions of those from both public and private sectors, including scientists, educators, media makers, policy makers, and Indigenous people, we serve to expand the public's understanding of ocean science by working in concert with the motion inherent in its story, and thus foster true accompaniment in the crafting of its narrative.

Tomlinson and Lipsitz pose the challenge that the concept of accompaniment is one that is not generally valued in a competitive neoliberal society. “People are encouraged to think of themselves as entrepreneurs of their own identities, careers, and public images.”[310] They argue that our society does not reward collaboration, but instead cultivates antagonism and aggression among individuals. This is true to some extent, but in terms of advocacy, it gets us nowhere. It is my view that our own work can only be validated when we are challenged, questioned, and pushed by each other to step outside the “established” perimeters of our study. Only from that vantage, will we be permitted the freedom to think deeply, and perhaps differently, about how our methods affect our work, our legacy. As Tomlinson and Lipsitz write,

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[309] Tomlinson and Lipsitz, 1.
[310] Ibid., 12.

> Accompaniment can thus be the basis of a powerful counterculture inside science as well as an important bridge to all the creative, critical, and contemplative thinking that goes on outside it. It can guide us in our efforts as reviewers, editors, and teachers to support work that is contributive rather than competitive.[311]

Accompaniment will guide us in shaping our legacy as Americans and as environmental stewards. We are experiencing an oceanic turn born of a necessity, or perhaps more aptly, desperation, to safeguard the most critical ecosystem on this planet. This turn is in itself multifaceted, calling for interdisciplinary work in a vital effort to figuring the Anthropocene and to informing and expanding sea ontologies. If the chasm between scientist and the layperson grows smaller and less frightening, the foundation of understanding and knowledge will only broaden. Once that forum for exchange is established, the potential to affect policy and make real change with regard to the ocean becomes possible. Media makers, historians, scientists, and the public all share a role in that.

This dissertation emerges at the confluence of ocean science, visual media and the American Experience. Though I don't pretend to know every stretch of these separate tributaries, I do know the value of their convergence -- the potency of listening to each other, especially those with whom we think we have little in common, and the power that is transferred when those voices are drawn together. Only then can we begin to add depth to our conversations, and texture to our work -- the work our work needs to do.

At its core, this dissertation is as much about the story of the ocean as it is the story of storytelling. The way in which the narrative unfolds marks the difference

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[311] Ibid., 13.

between viewing the ocean as a space that is apart from us, or a place of which we are a part. The way we as Americans come to explore, to view, and to *value* the story of "our collective ocean" may very well seal its – and most certainly our -- fate. Indeed, our history as its stewards is written on the waves.

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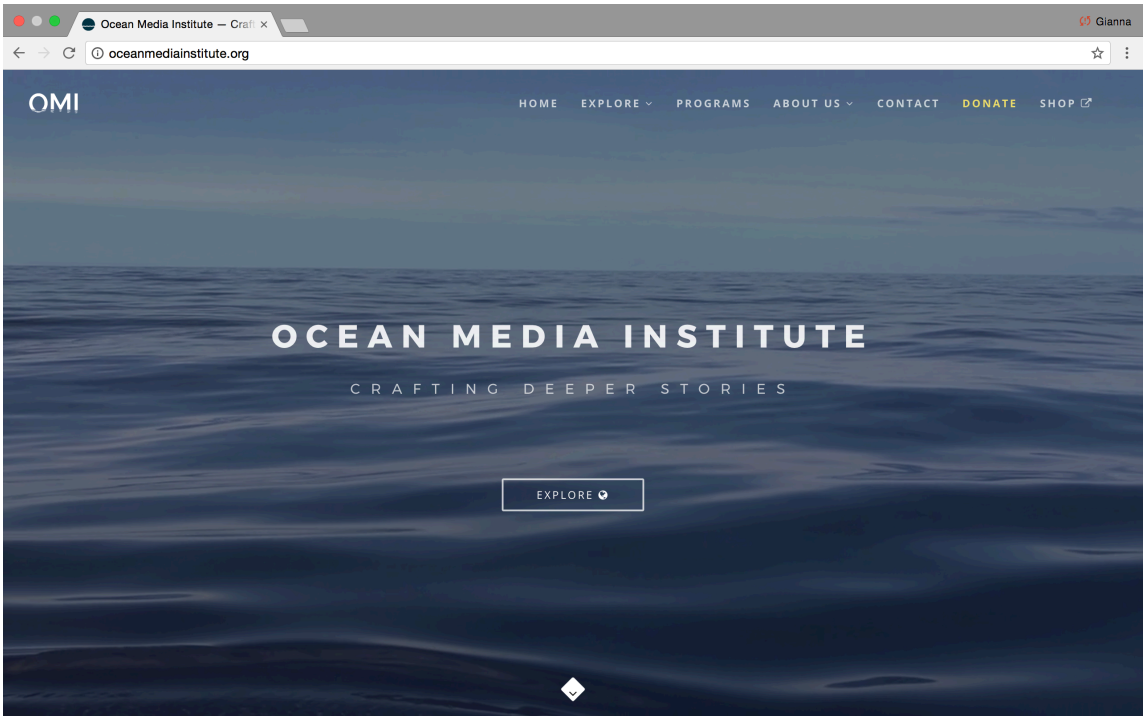
APPENDICES

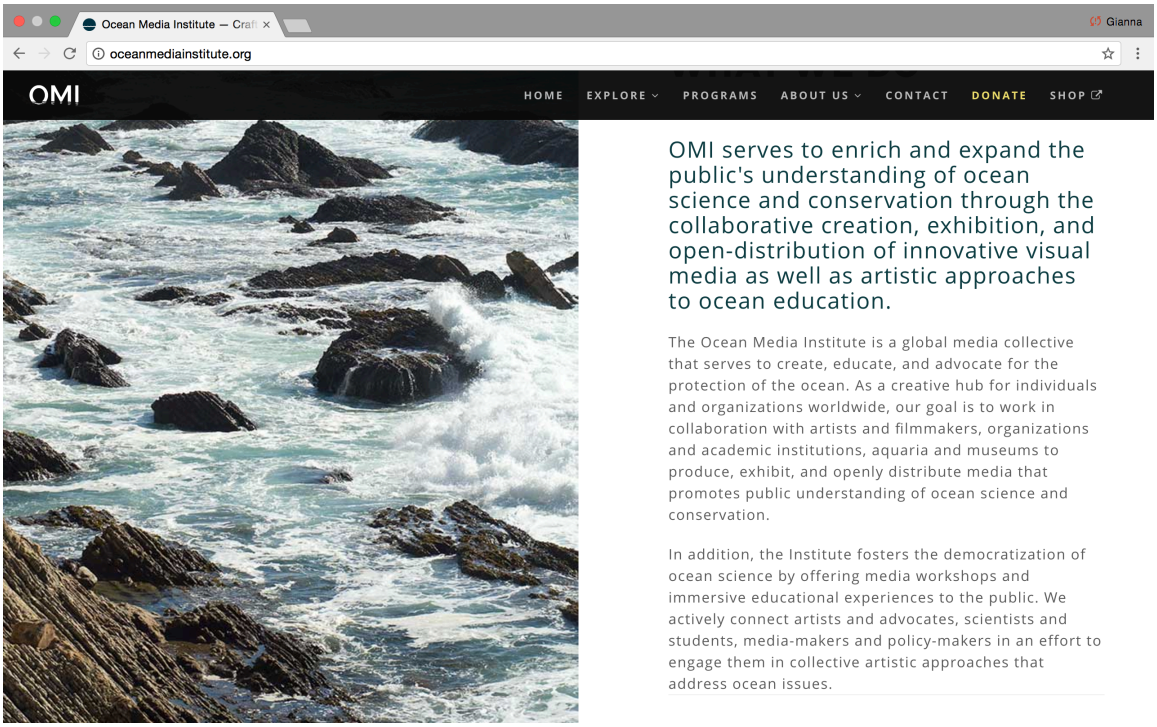
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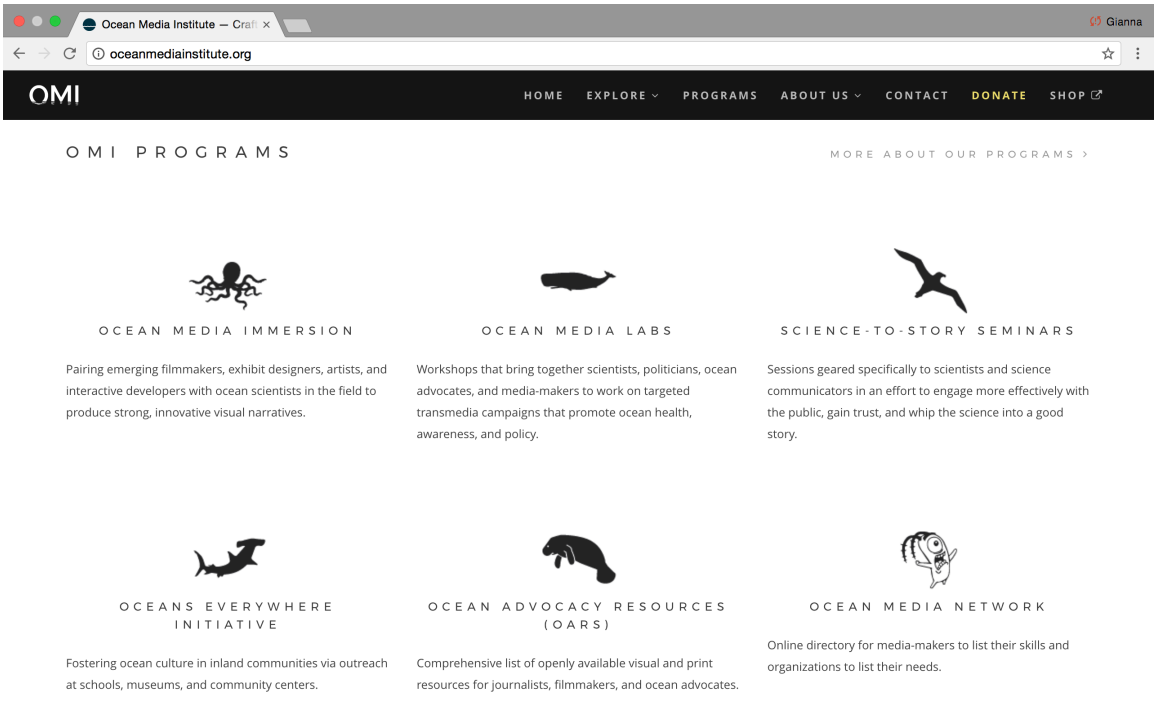
THE OCEAN MEDIA INSTITUTE WEBSITE

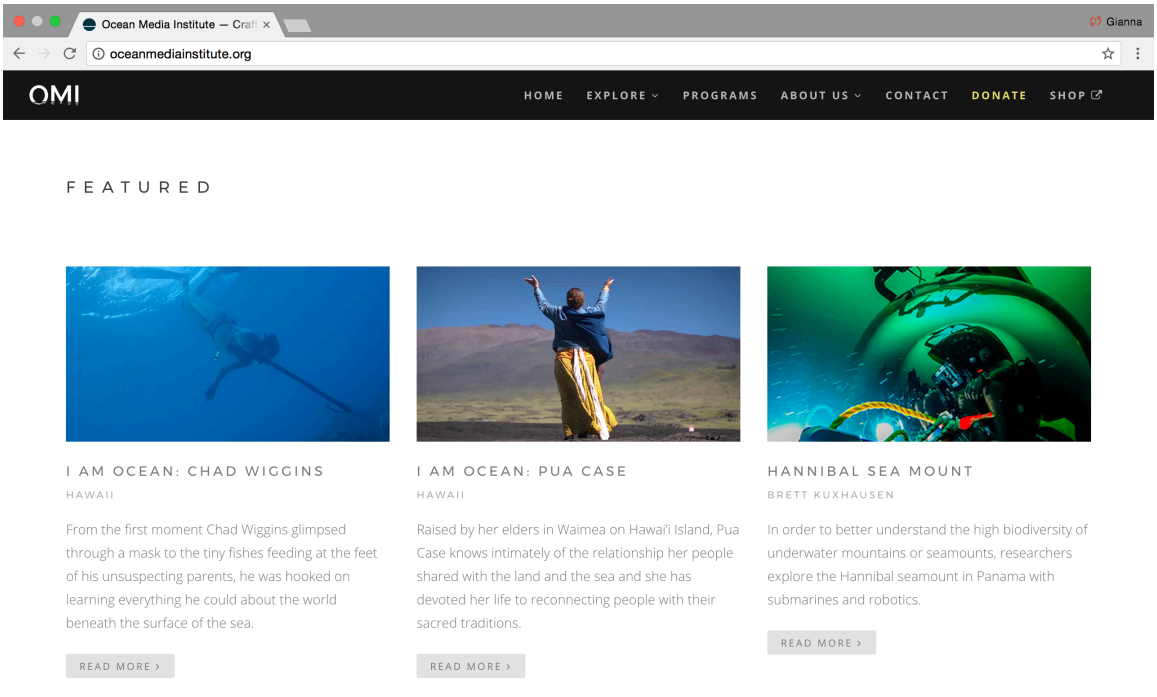
The Ocean Media Institute's website (oceanmediainstitute.org) is expansive and as we continue to build our programs, so too will the website continue to evolve. The following are the pages of the site in its entirety as of the time of this writing.

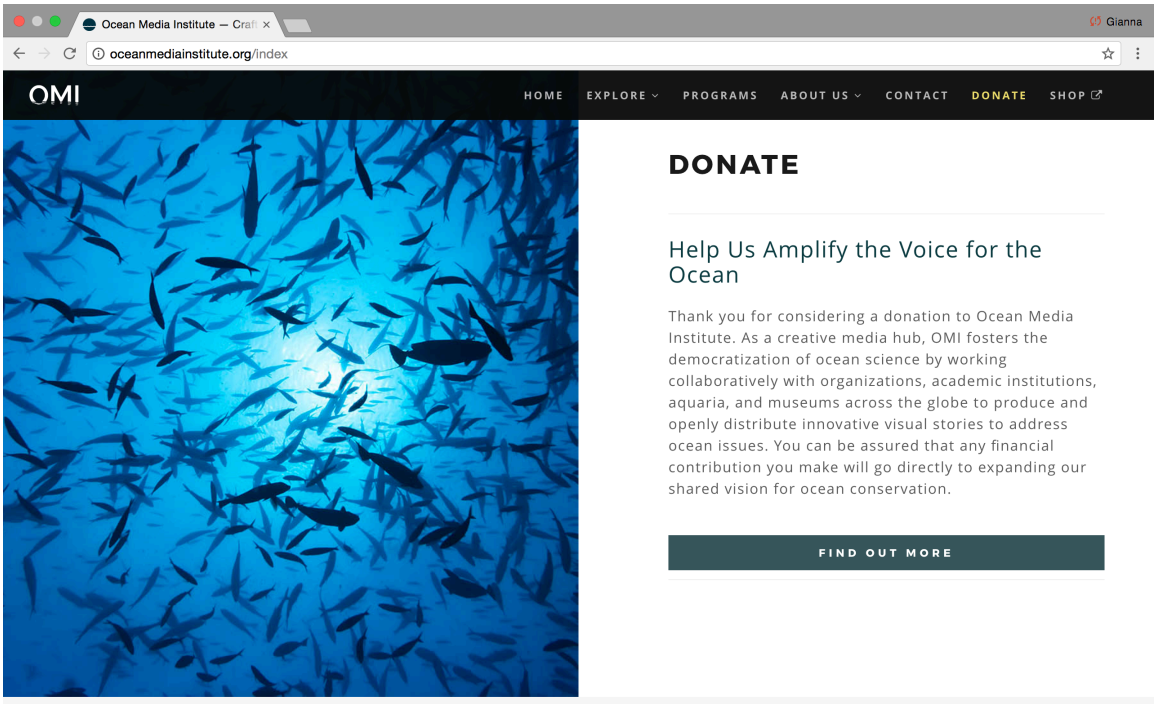
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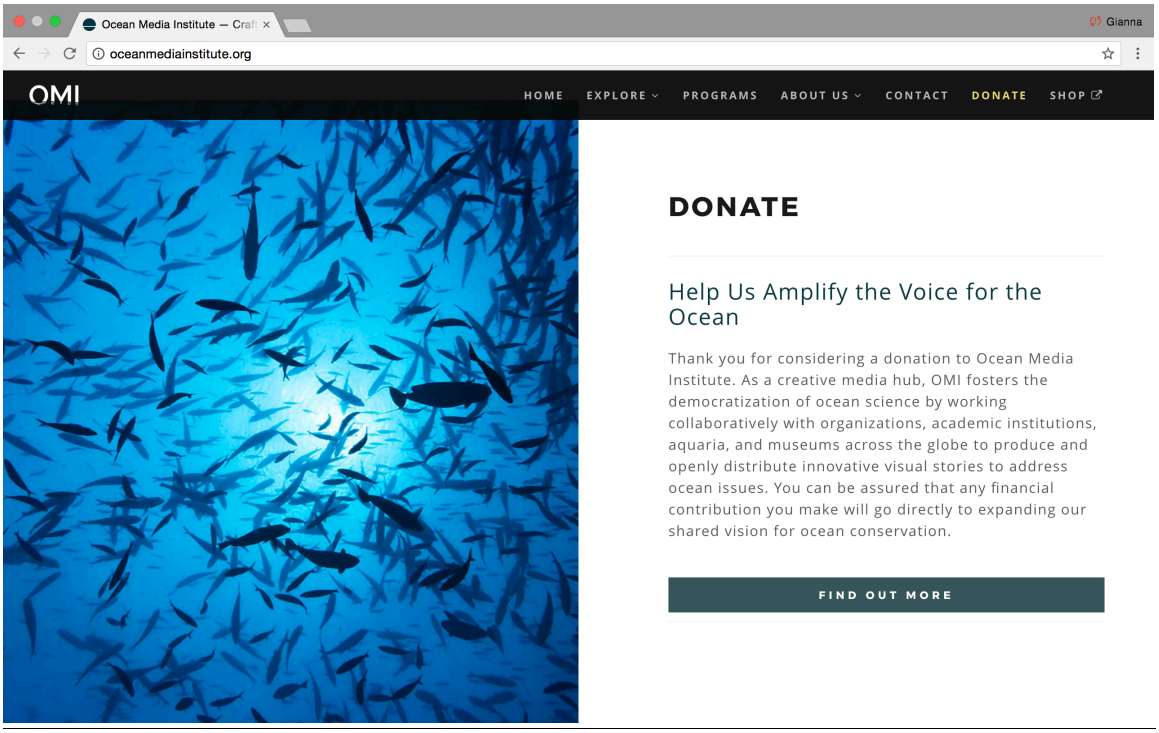


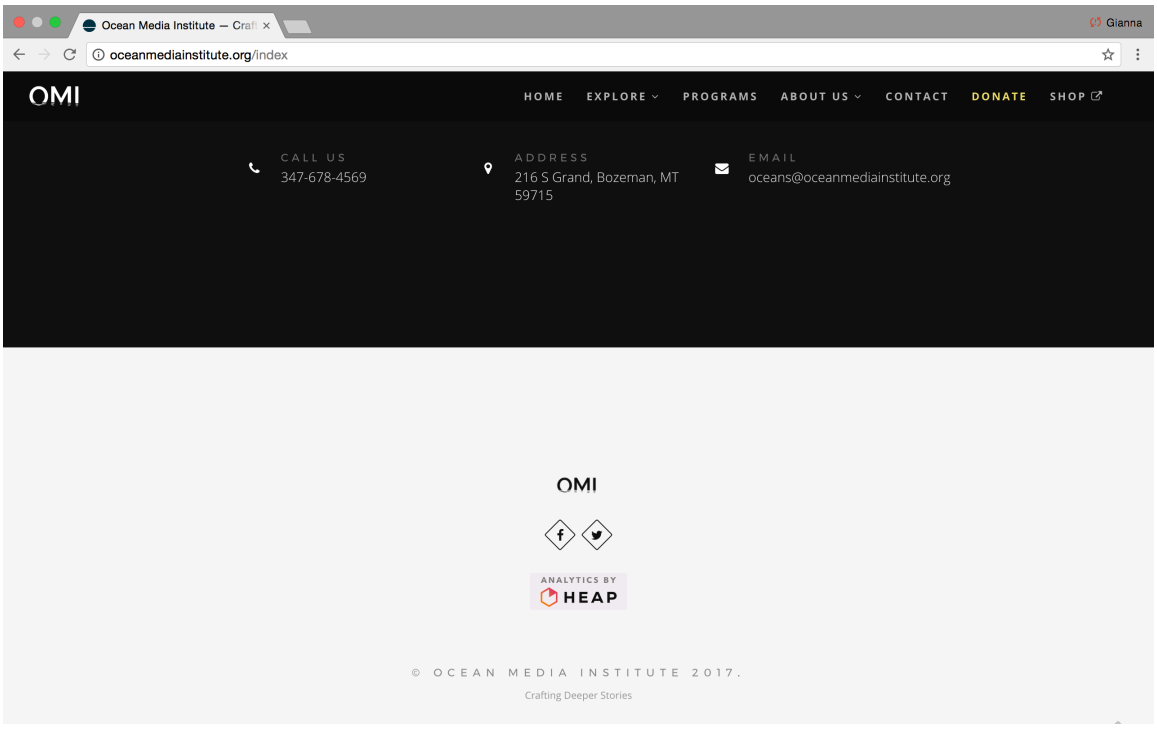

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OMI serves to enrich and expand the public's understanding of ocean science and conservation through the collaborative creation, exhibition, and open-distribution of innovative visual media as well as artistic approaches to ocean education.
The Ocean Media Institute is a global media collective that serves to create, educate, and advocate for the protection of the ocean. As a creative hub for individuals and organizations worldwide, our goal is to work in collaboration with artists and filmmakers, organizations and academic institutions, aquaria and museums to produce, exhibit, and openly distribute media that promotes public understanding of ocean science and conservation.
In addition, the Institute fosters the democratization of ocean science by offering media workshops and immersive educational experiences to the public. We actively connect artists and advocates, scientists and students, media-makers and policy-makers in an effort to engage them in collective artistic approaches that address ocean issues.


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OCEAN MEDIA IMMERSION
Pairing emerging filmmakers, exhibit designers, artists, and interactive developers with ocean scientists in the field to produce strong, innovative visual narratives.
OCEAN MEDIA LABS
Workshops that bring together scientists, politicians, ocean advocates, and media-makers to work on targeted transmedia campaigns that promote ocean health, awareness, and policy.
SCIENCE-TO-STORY SEMINARS
Sessions geared specifically to scientists and science communicators in an effort to engage more effectively with the public, gain trust, and whip the science into a good story.
OCEANS EVERYWHERE INITIATIVE
Fostering ocean culture in inland communities via outreach at schools, museums, and community centers.
OCEAN ADVOCACY RESOURCES (OARS)
Comprehensive list of openly available visual and print resources for journalists, filmmakers, and ocean advocates.
OCEAN MEDIA NETWORK
Online directory for media-makers to list their skills and organizations to list their needs.

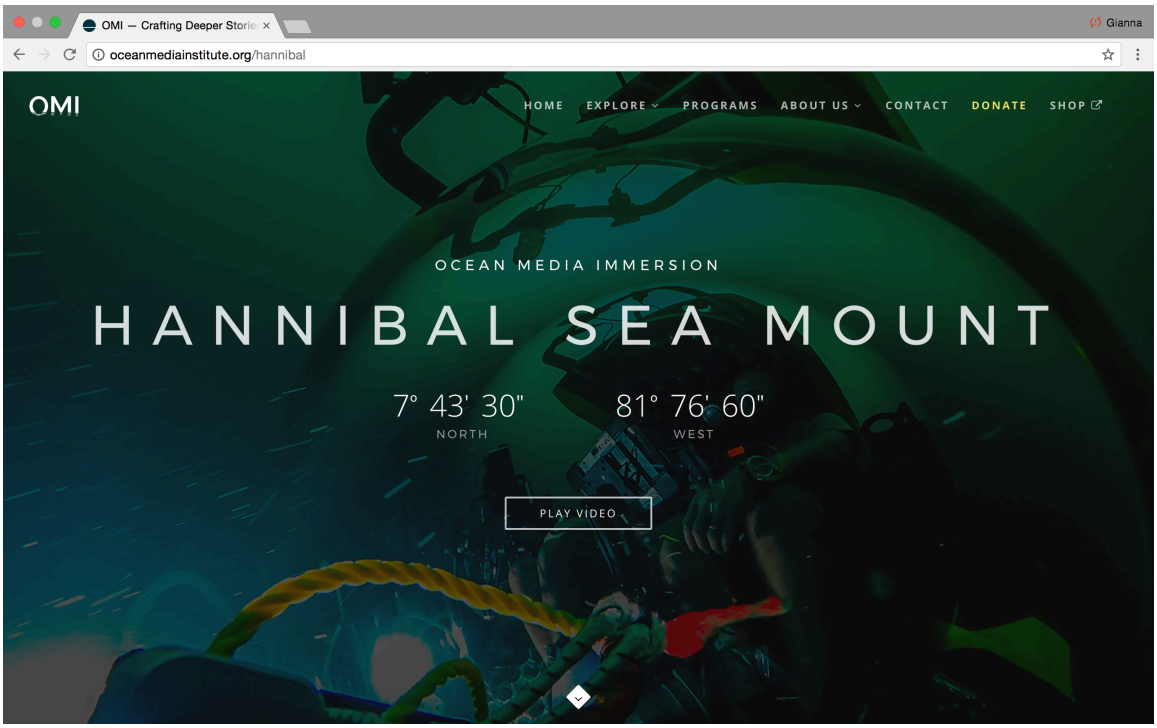

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FEATURED
I AM OCEAN: CHAD WIGGINS
HAWAII
From the first moment Chad Wiggins glimpsed through a mask to the tiny fishes feeding at the feet of his unsuspecting parents, he was hooked on learning everything he could about the world beneath the surface of the sea.
READ MORE ›
I AM OCEAN: PUA CASE
HAWAII
Raised by her elders in Waimea on Hawai'i Island, Pua Case knows intimately of the relationship her people shared with the land and the sea and she has devoted her life to reconnecting people with their sacred traditions.
READ MORE ›
HANNIBAL SEA MOUNT
BRETT KUXHAUSEN
In order to better understand the high biodiversity of underwater mountains or seamounts, researchers explore the Hannibal seamount in Panama with submarines and robotics.
READ MORE ›

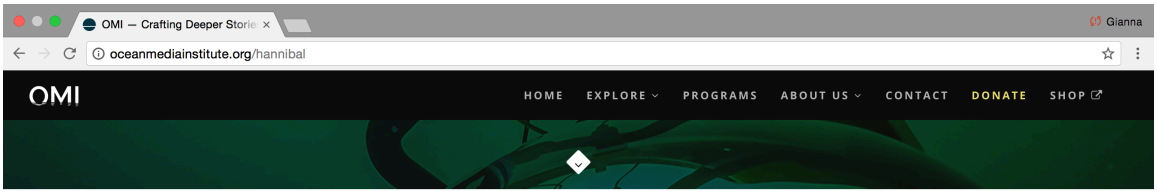

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Crafting Deeper Stories

Explore: Panama Seamount



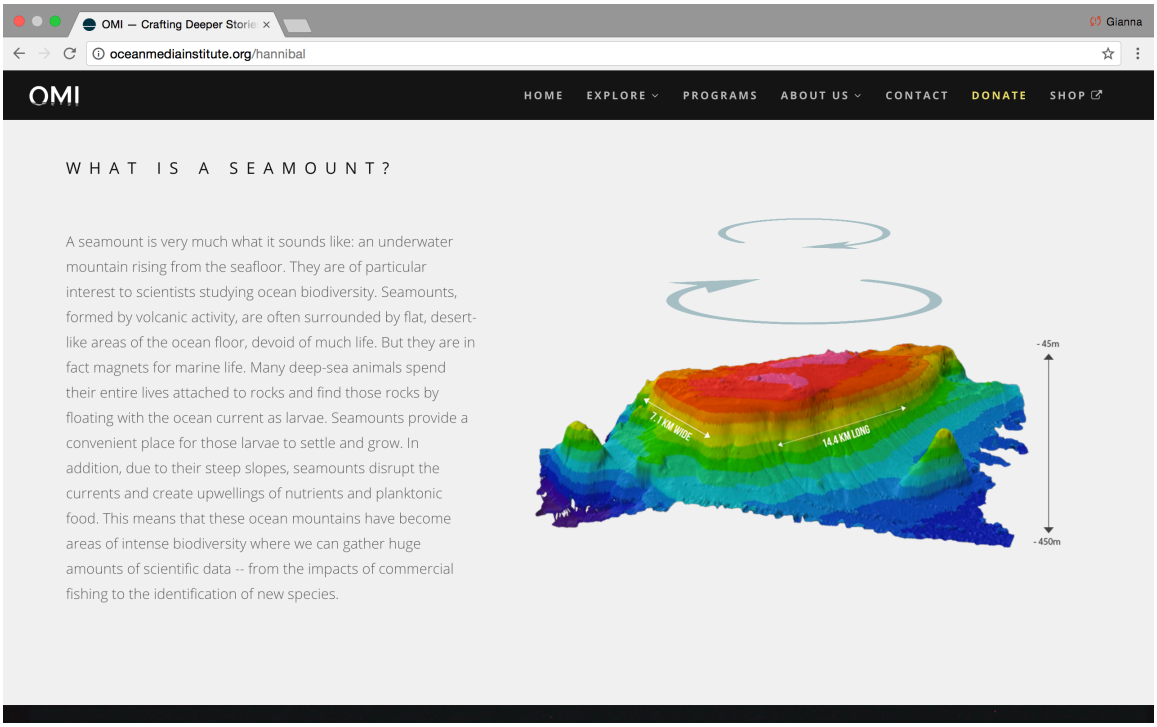


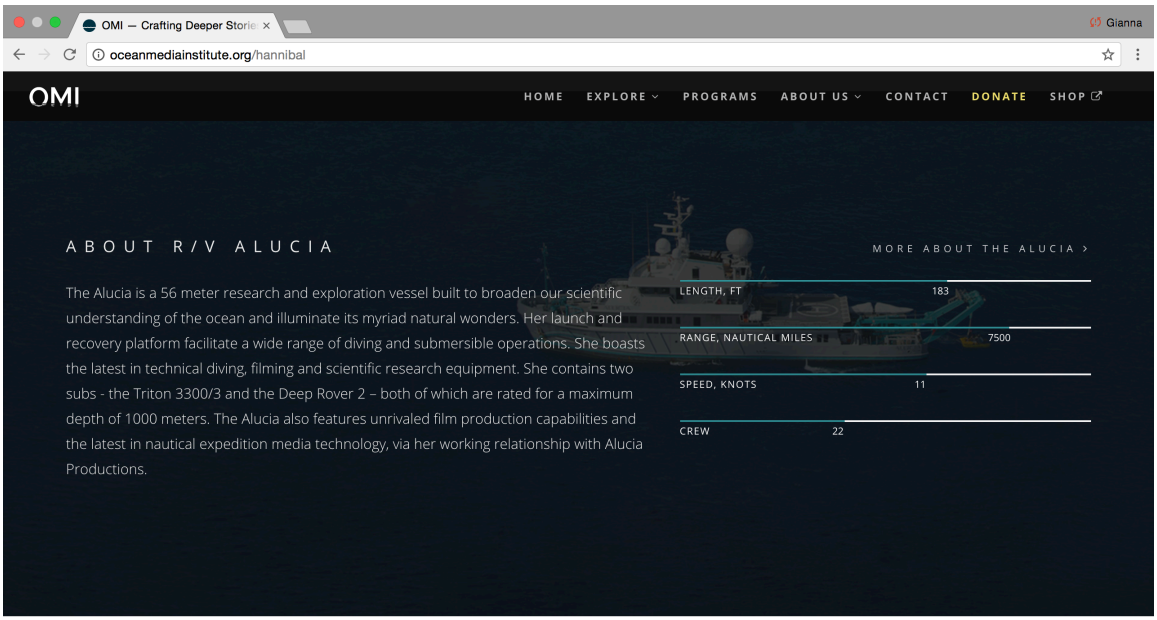
EXPEDITION DETAILS

LOCATION:	COIBA NATIONAL PARK, PANAMA
DATE:	MARCH 31 - APRIL 14, 2015
WHO:	WHOI, ALUCIA, UNIVERSITY OF PORTO
FILMMAKER:	BRETT KUXHAUSEN

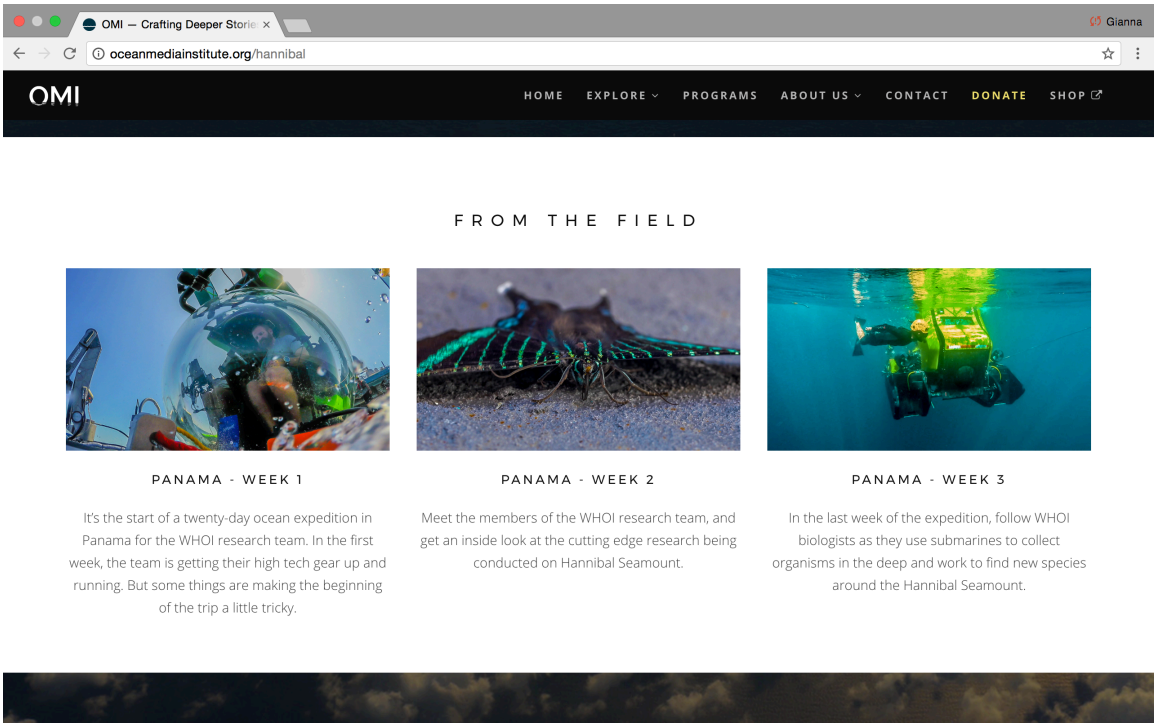
The Hannibal Bank Seamount, 20 km west of Coiba Island, Panama, is an ideal natural laboratory to explore the processes that determine both bottom and water-column ecological hotspots. Internationally recognized for its abundant fish populations, this huge undersea mountain is a popular destination for sports fishermen; yet like most seamounts, the mechanisms that produce its biological richness are poorly known.

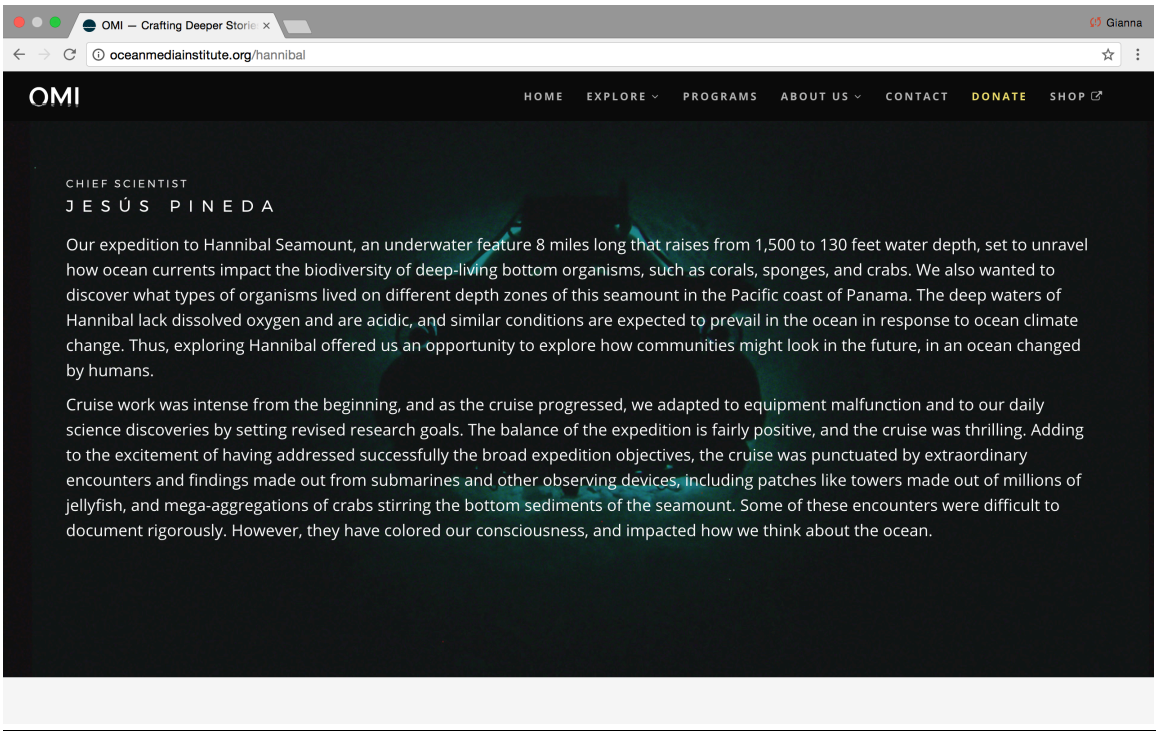
The goal of this expedition was to uncover how ecological patterns in bottom faunal zonation, water-column fish aggregation, and elevated biodiversity are determined. By collecting samples, extracting DNA to identify species, and researching how the location of marine life corresponds to environmental factors such as temperature, salinity, and currents, biologists now better understand the processes that make this underwater mountain habitat so unique. By sharing their findings with local and regional stakeholders, resource managers will have access to the information they need to work together to develop a sound management plan for this rich and diverse ecosystem.

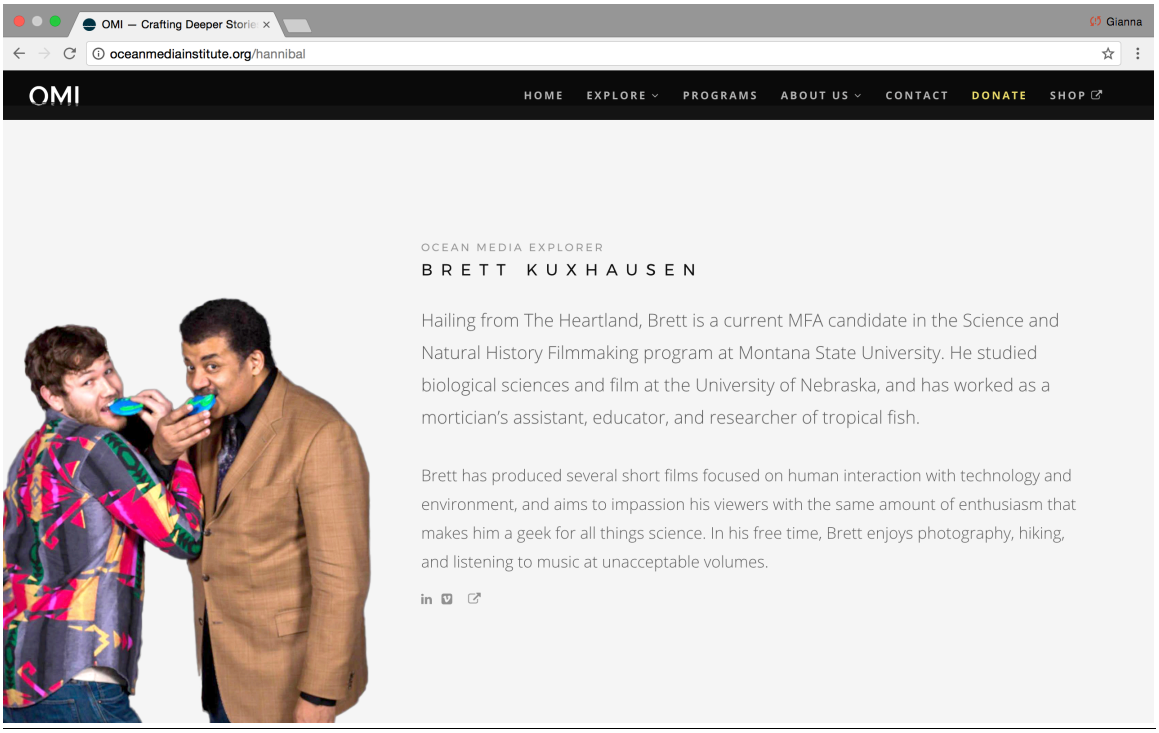


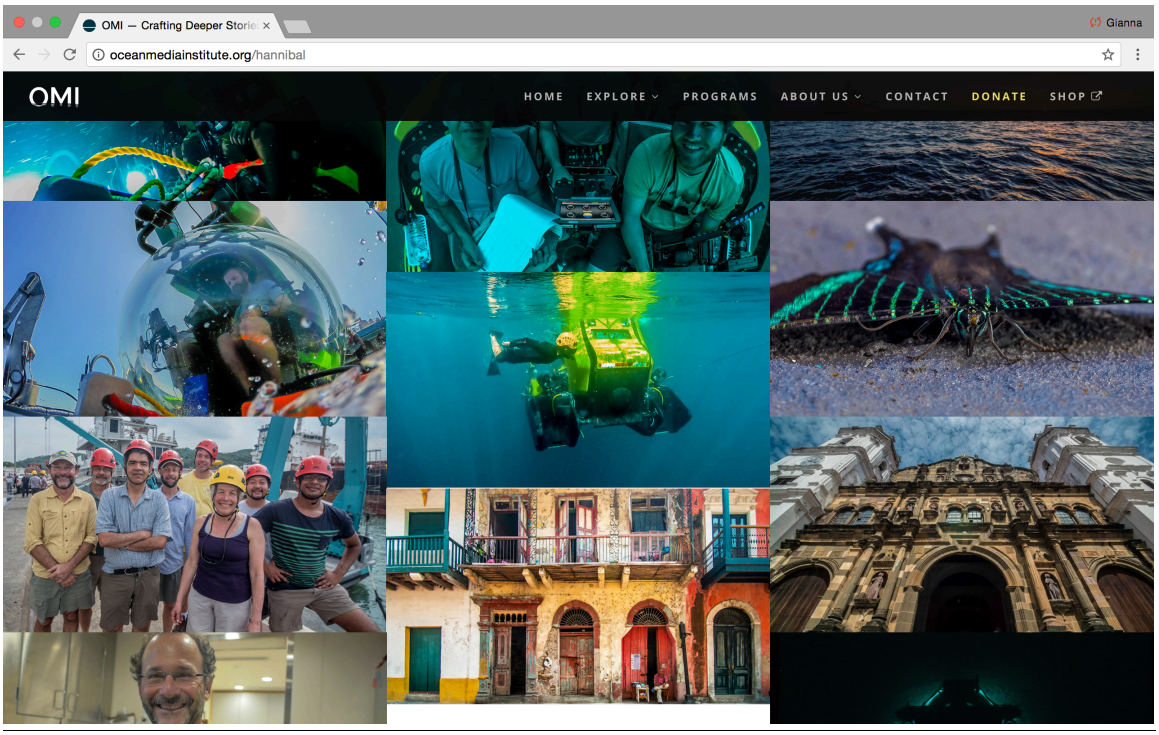


FROM THE FIELD

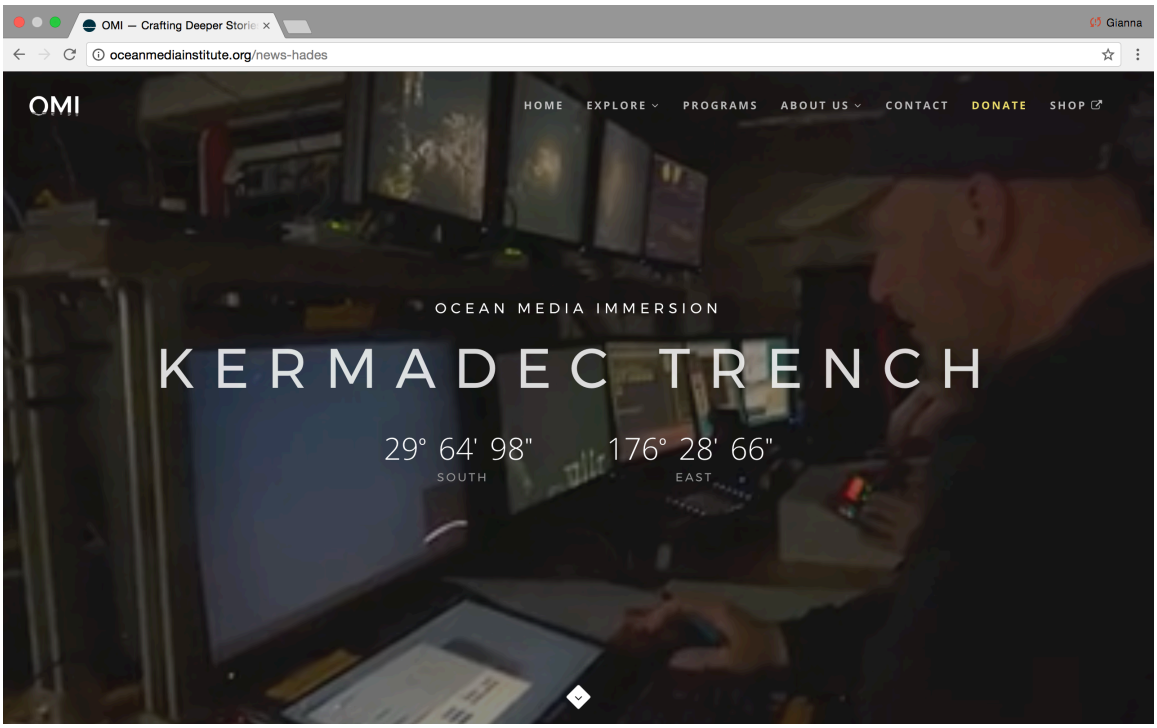

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FROM THE FIELD
PANAMA - WEEK 1
It's the start of a twenty-day ocean expedition in Panama for the WHOI research team. In the first week, the team is getting their high tech gear up and running. But some things are making the beginning of the trip a little tricky.
PANAMA - WEEK 2
Meet the members of the WHOI research team, and get an inside look at the cutting edge research being conducted on Hannibal Seamount.
PANAMA - WEEK 3
In the last week of the expedition, follow WHOI biologists as they use submarines to collect organisms in the deep and work to find new species around the Hannibal Seamount.

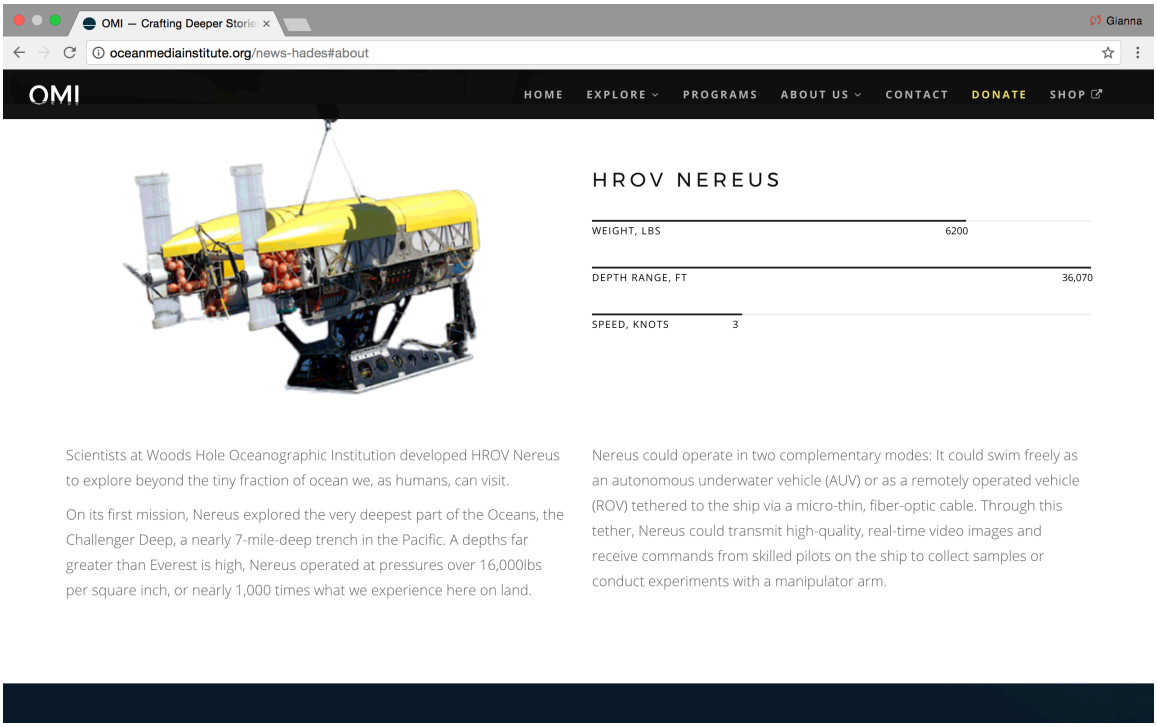

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CHIEF SCIENTIST
JESÚS PINEDA
Our expedition to Hannibal Seamount, an underwater feature 8 miles long that raises from 1,500 to 130 feet water depth, set to unravel how ocean currents impact the biodiversity of deep-living bottom organisms, such as corals, sponges, and crabs. We also wanted to discover what types of organisms lived on different depth zones of this seamount in the Pacific coast of Panama. The deep waters of Hannibal lack dissolved oxygen and are acidic, and similar conditions are expected to prevail in the ocean in response to ocean climate change. Thus, exploring Hannibal offered us an opportunity to explore how communities might look in the future, in an ocean changed by humans.
Cruise work was intense from the beginning, and as the cruise progressed, we adapted to equipment malfunction and to our daily science discoveries by setting revised research goals. The balance of the expedition is fairly positive, and the cruise was thrilling. Adding to the excitement of having addressed successfully the broad expedition objectives, the cruise was punctuated by extraordinary encounters and findings made out from submarines and other observing devices, including patches like towers made out of millions of jellyfish, and mega-aggregations of crabs stirring the bottom sediments of the seamount. Some of these encounters were difficult to document rigorously. However, they have colored our consciousness, and impacted how we think about the ocean.

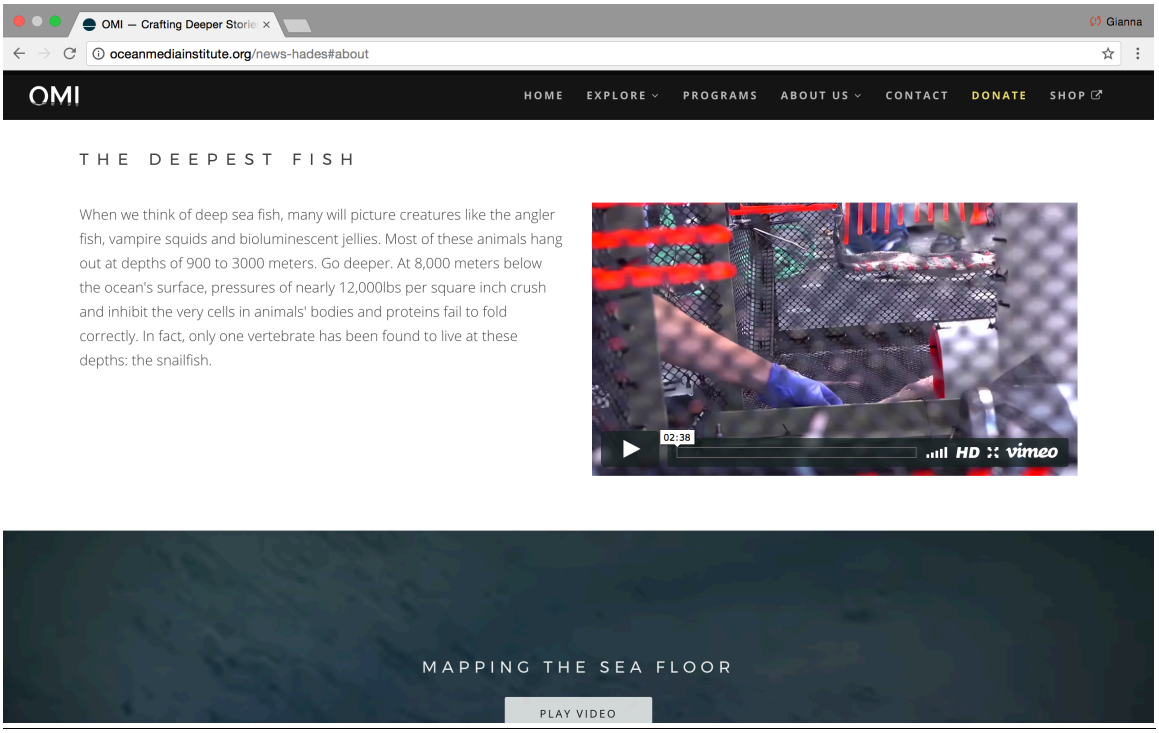

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OCEAN MEDIA EXPLORER
BRETT KUXHAUSEN
Hailing from The Heartland, Brett is a current MFA candidate in the Science and Natural History Filmmaking program at Montana State University. He studied biological sciences and film at the University of Nebraska, and has worked as a mortician's assistant, educator, and researcher of tropical fish.
Brett has produced several short films focused on human interaction with technology and environment, and aims to impassion his viewers with the same amount of enthusiasm that makes him a geek for all things science. In his free time, Brett enjoys photography, hiking, and listening to music at unacceptable volumes.

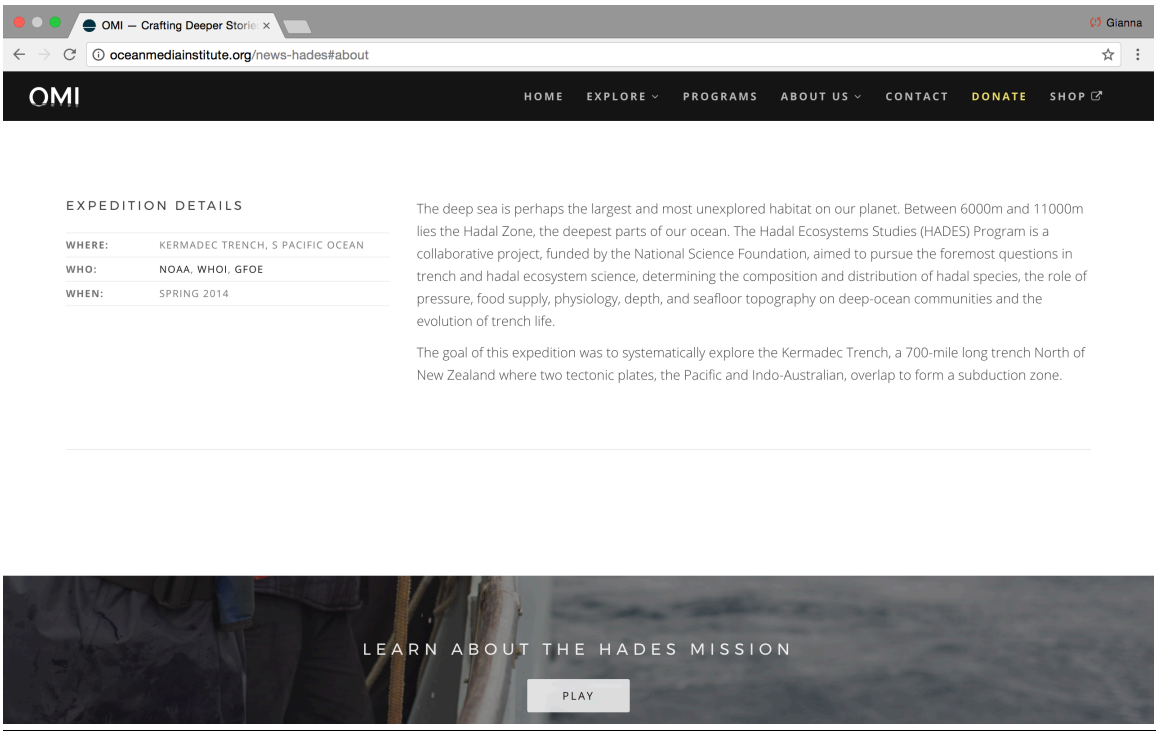

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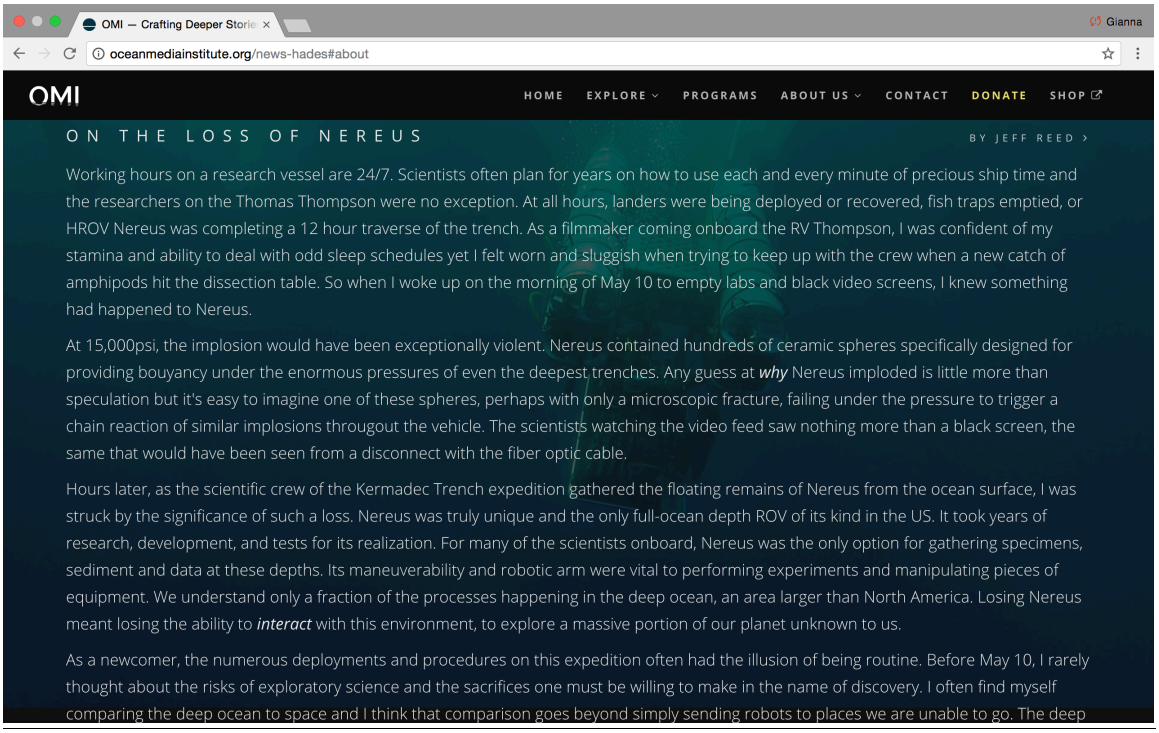
Explore: Kermadec Trench

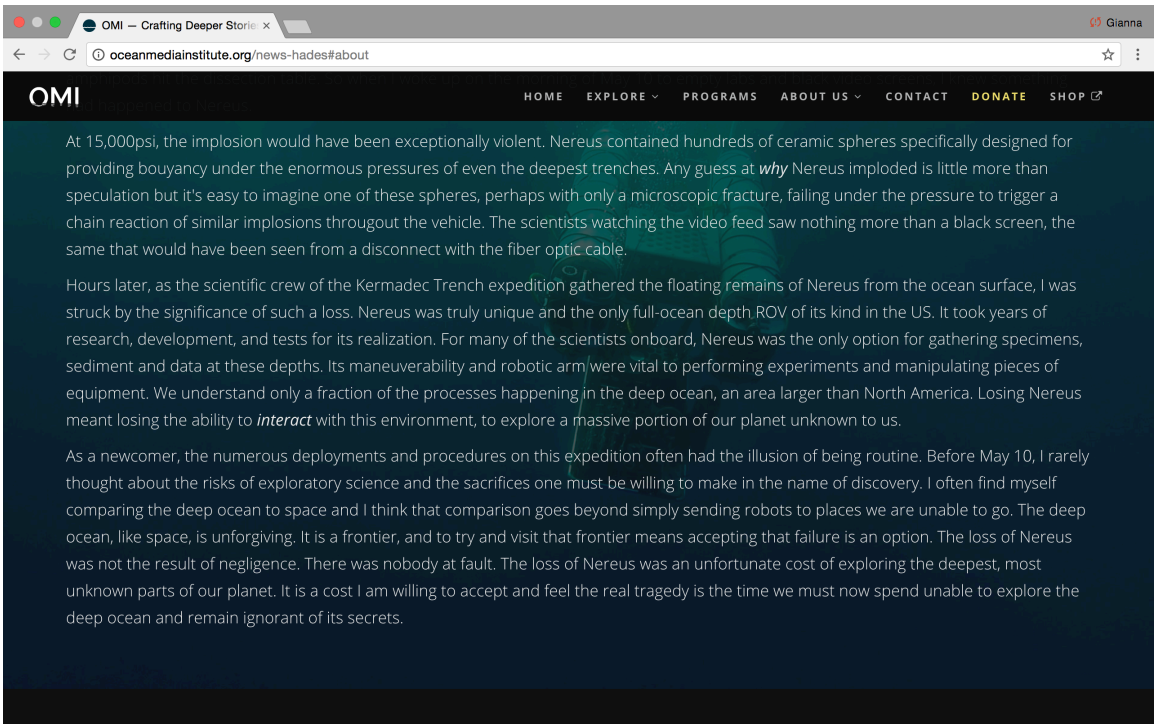




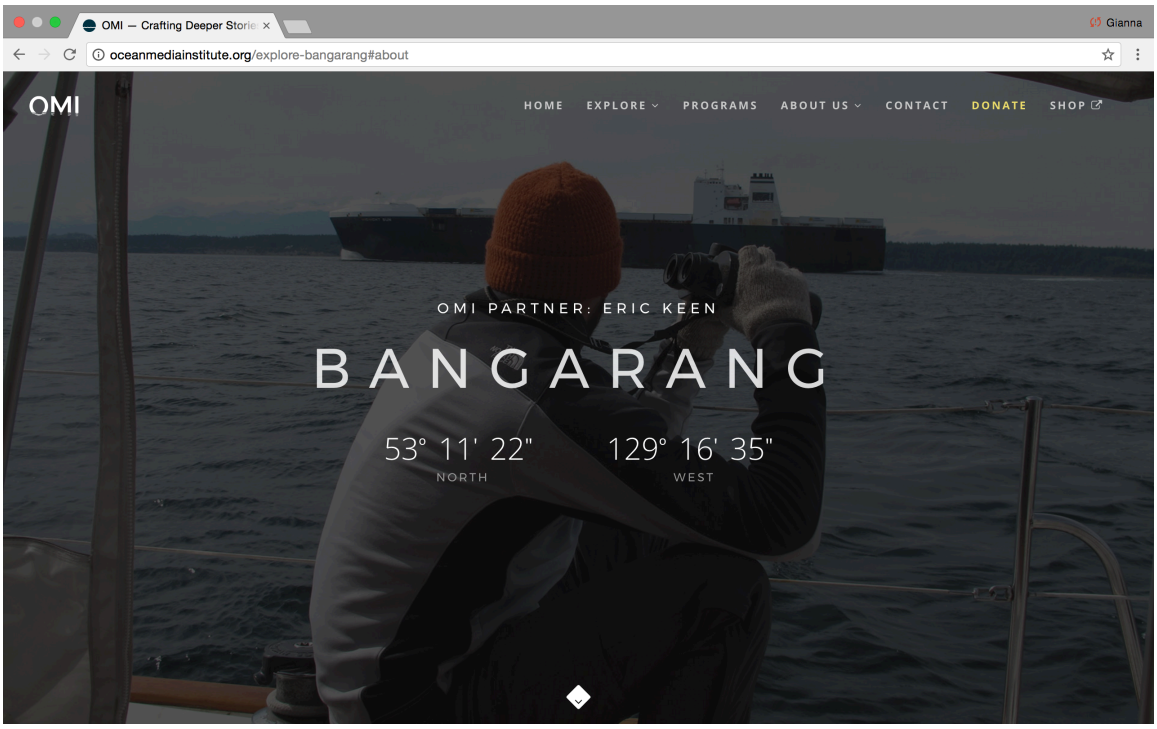

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THE DEEPEST FISH
When we think of deep sea fish, many will picture creatures like the angler fish, vampire squids and bioluminescent jellies. Most of these animals hang out at depths of 900 to 3000 meters. Go deeper. At 8,000 meters below the ocean's surface, pressures of nearly 12,000lbs per square inch crush and inhibit the very cells in animals' bodies and proteins fail to fold correctly. In fact, only one vertebrate has been found to live at these depths: the snailfish.
02:38
HD
vimeo
MAPPING THE SEA FLOOR
PLAY VIDEO

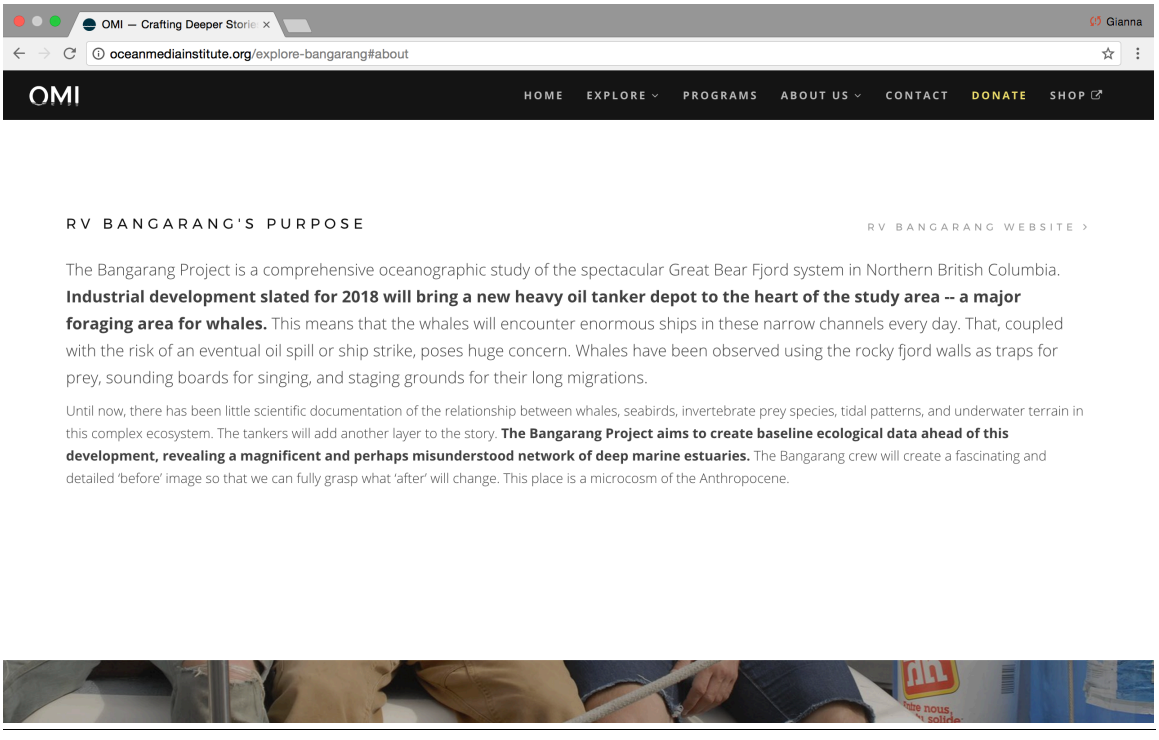

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EXPEDITION DETAILS
WHERE: KERMADEC TRENCH, S PACIFIC OCEAN
WHO: NOAA, WHOI, GFOE
WHEN: SPRING 2014
The deep sea is perhaps the largest and most unexplored habitat on our planet. Between 6000m and 11000m lies the Hadal Zone, the deepest parts of our ocean. The Hadal Ecosystems Studies (HADES) Program is a collaborative project, funded by the National Science Foundation, aimed to pursue the foremost questions in trench and hadal ecosystem science, determining the composition and distribution of hadal species, the role of pressure, food supply, physiology, depth, and seafloor topography on deep-ocean communities and the evolution of trench life.
The goal of this expedition was to systematically explore the Kermadec Trench, a 700-mile long trench North of New Zealand where two tectonic plates, the Pacific and Indo-Australian, overlap to form a subduction zone.
LEARN ABOUT THE HADES MISSION
PLAY

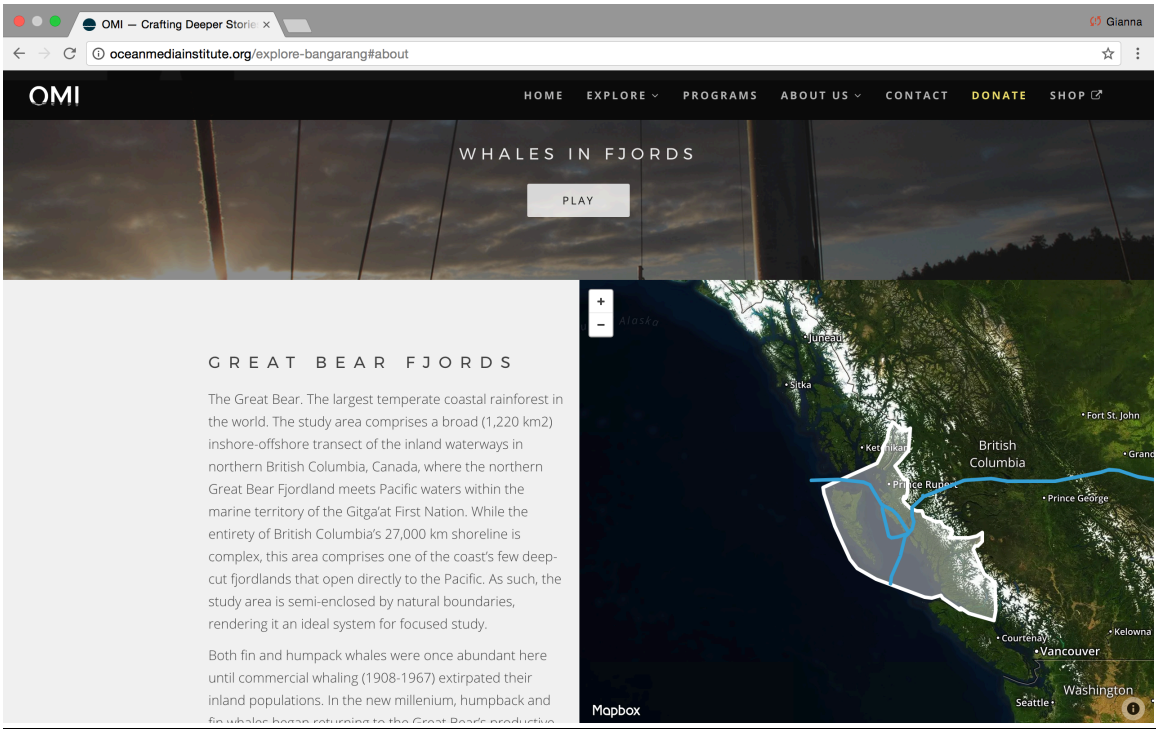

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ON THE LOSS OF NEREUS
BY JEFF REED ›
Working hours on a research vessel are 24/7. Scientists often plan for years on how to use each and every minute of precious ship time and the researchers on the Thomas Thompson were no exception. At all hours, landers were being deployed or recovered, fish traps emptied, or HROV Nereus was completing a 12 hour traverse of the trench. As a filmmaker coming onboard the RV Thompson, I was confident of my stamina and ability to deal with odd sleep schedules yet I felt worn and sluggish when trying to keep up with the crew when a new catch of amphipods hit the dissection table. So when I woke up on the morning of May 10 to empty labs and black video screens, I knew something had happened to Nereus.
At 15,000psi, the implosion would have been exceptionally violent. Nereus contained hundreds of ceramic spheres specifically designed for providing bouyancy under the enormous pressures of even the deepest trenches. Any guess at why Nereus imploded is little more than speculation but it's easy to imagine one of these spheres, perhaps with only a microscopic fracture, failing under the pressure to trigger a chain reaction of similar implosions througout the vehicle. The scientists watching the video feed saw nothing more than a black screen, the same that would have been seen from a disconnect with the fiber optic cable.
Hours later, as the scientific crew of the Kermadec Trench expedition gathered the floating remains of Nereus from the ocean surface, I was struck by the significance of such a loss. Nereus was truly unique and the only full-ocean depth ROV of its kind in the US. It took years of research, development, and tests for its realization. For many of the scientists onboard, Nereus was the only option for gathering specimens, sediment and data at these depths. Its maneuverability and robotic arm were vital to performing experiments and manipulating pieces of equipment. We understand only a fraction of the processes happening in the deep ocean, an area larger than North America. Losing Nereus meant losing the ability to interact with this environment, to explore a massive portion of our planet unknown to us.
As a newcomer, the numerous deployments and procedures on this expedition often had the illusion of being routine. Before May 10, I rarely thought about the risks of exploratory science and the sacrifices one must be willing to make in the name of discovery. I often find myself comparing the deep ocean to space and I think that comparison goes beyond simply sending robots to places we are unable to go. The deep

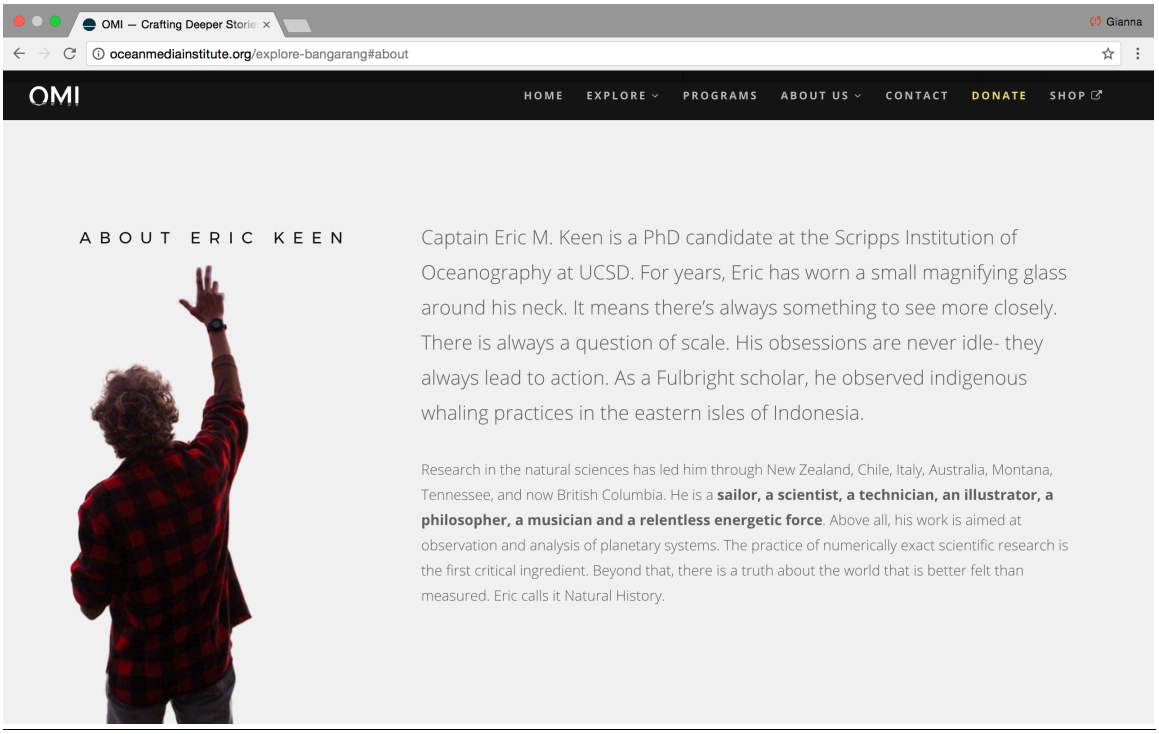

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As a newcomer, the numerous deployments and procedures on this expedition often had the illusion of being routine. Before May 10, I rarely thought about the risks of exploratory science and the sacrifices one must be willing to make in the name of discovery. I often find myself comparing the deep ocean to space and I think that comparison goes beyond simply sending robots to places we are unable to go. The deep ocean, like space, is unforgiving. It is a frontier, and to try and visit that frontier means accepting that failure is an option. The loss of Nereus was not the result of negligence. There was nobody at fault. The loss of Nereus was an unfortunate cost of exploring the deepest, most unknown parts of our planet. It is a cost I am willing to accept and feel the real tragedy is the time we must now spend unable to explore the deep ocean and remain ignorant of its secrets.

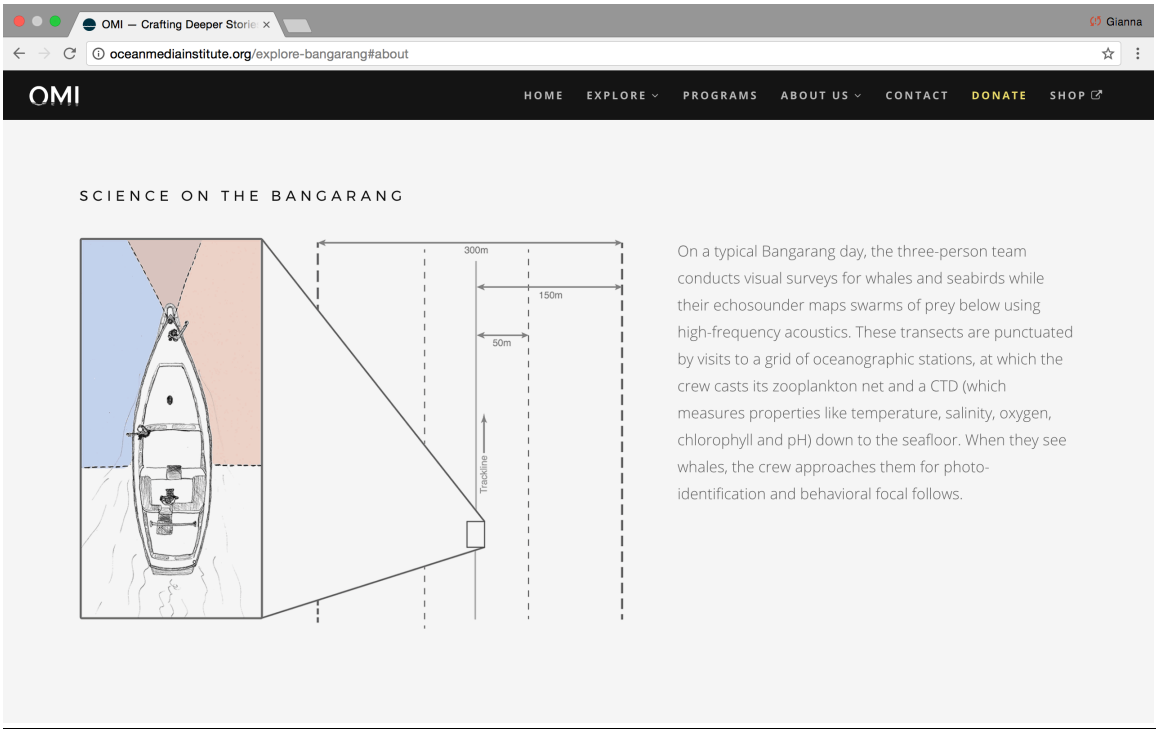
Explore: Great Bear Sea

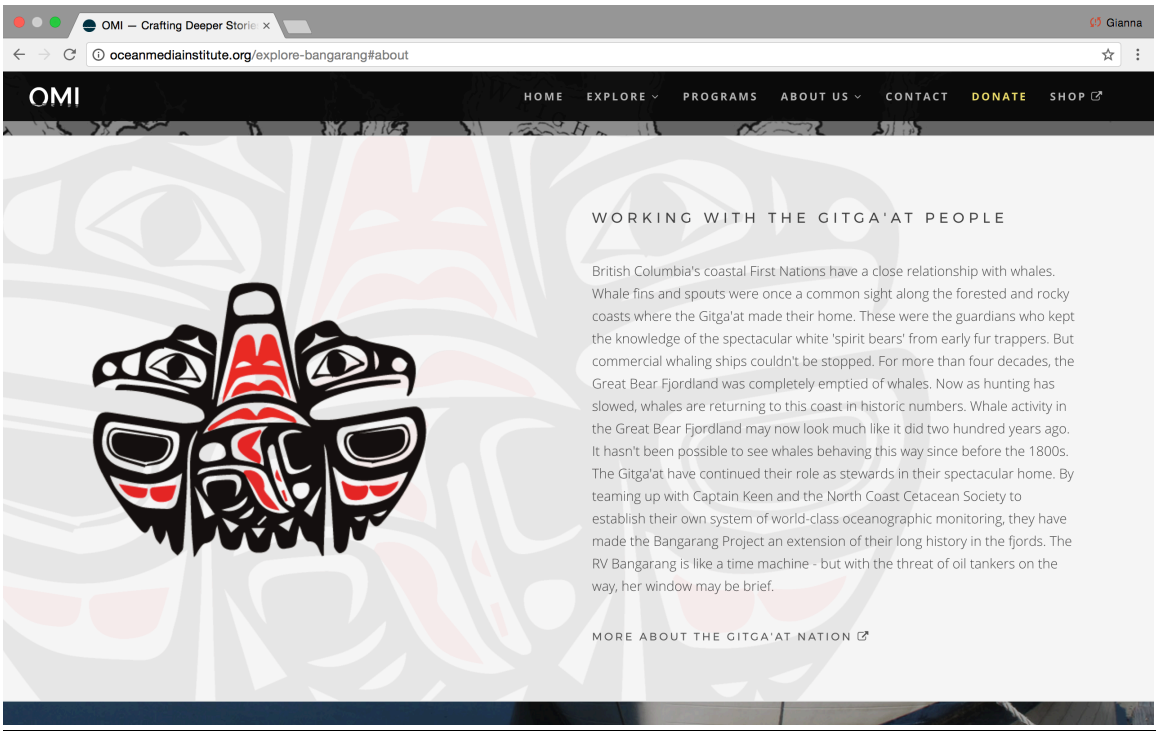


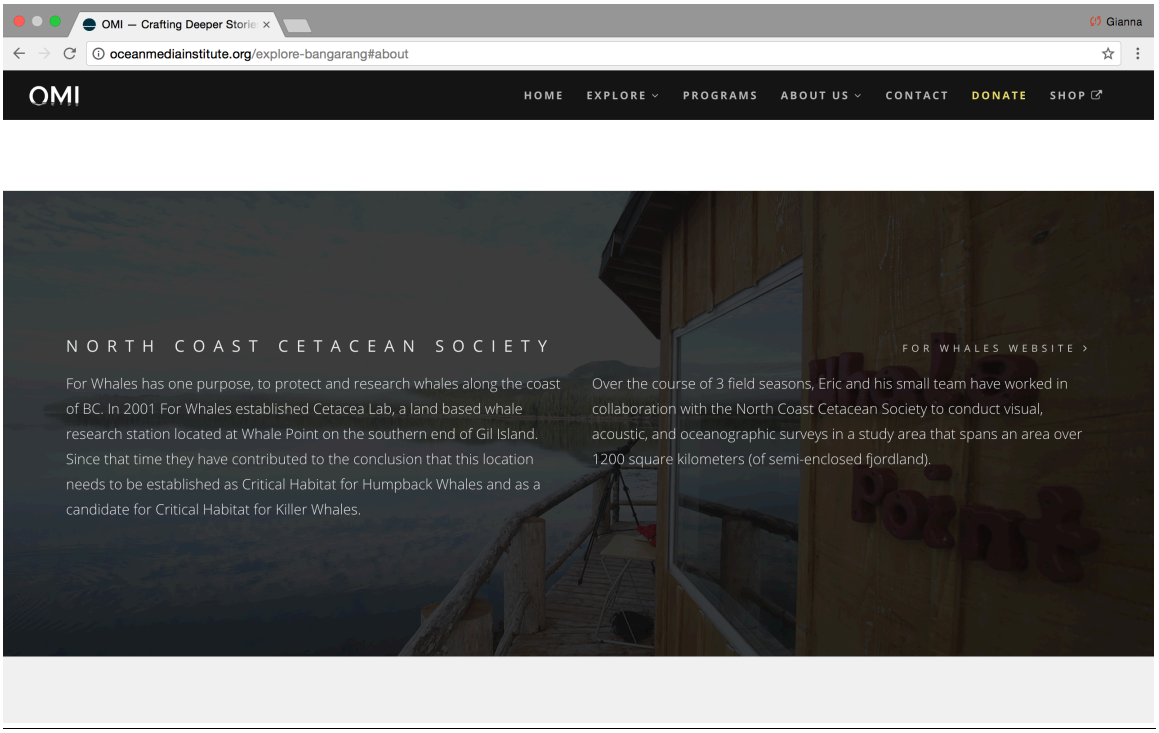


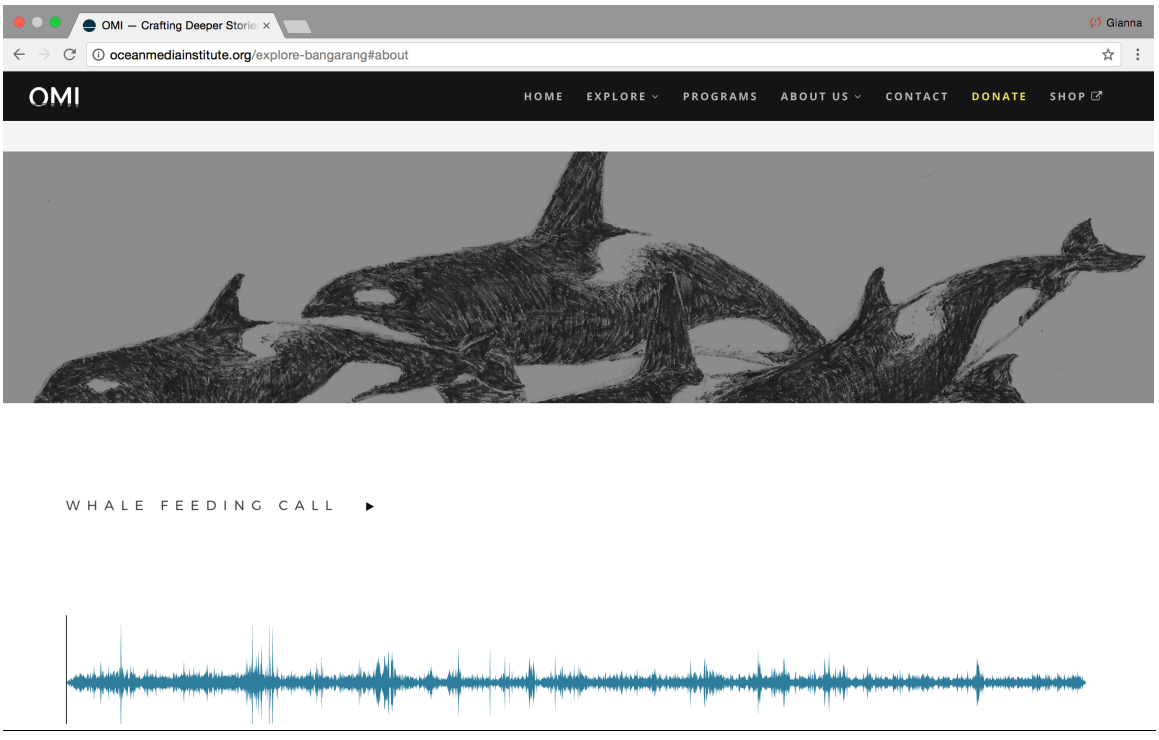

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WHALES IN FJORDS
PLAY
GREAT BEAR FJORDS
The Great Bear. The largest temperate coastal rainforest in the world. The study area comprises a broad (1,220 km2) inshore-offshore transect of the inland waterways in northern British Columbia, Canada, where the northern Great Bear Fjordland meets Pacific waters within the marine territory of the Gitga'at First Nation. While the entirety of British Columbia's 27,000 km shoreline is complex, this area comprises one of the coast's few deep-cut fjordlands that open directly to the Pacific. As such, the study area is semi-enclosed by natural boundaries, rendering it an ideal system for focused study.
Both fin and humpack whales were once abundant here until commercial whaling (1908-1967) extirpated their inland populations. In the new millenium, humpback and
Juneau
Sitka
Fort St. John
British Columbia
Prince George
Kelowna
Courtenay
Vancouver
Washington
Seattle
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ABOUT ERIC KEEN
Captain Eric M. Keen is a PhD candidate at the Scripps Institution of Oceanography at UCSD. For years, Eric has worn a small magnifying glass around his neck. It means there's always something to see more closely. There is always a question of scale. His obsessions are never idle- they always lead to action. As a Fulbright scholar, he observed indigenous whaling practices in the eastern isles of Indonesia.
Research in the natural sciences has led him through New Zealand, Chile, Italy, Australia, Montana, Tennessee, and now British Columbia. He is a **sailor, a scientist, a technician, an illustrator, a philosopher, a musician and a relentless energetic force**. Above all, his work is aimed at observation and analysis of planetary systems. The practice of numerically exact scientific research is the first critical ingredient. Beyond that, there is a truth about the world that is better felt than measured. Eric calls it Natural History.


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SCIENCE ON THE BANGARANG
300m
150m
50m
Trackline
On a typical Bangarang day, the three-person team conducts visual surveys for whales and seabirds while their echosounder maps swarms of prey below using high-frequency acoustics. These transects are punctuated by visits to a grid of oceanographic stations, at which the crew casts its zooplankton net and a CTD (which measures properties like temperature, salinity, oxygen, chlorophyll and pH) down to the seafloor. When they see whales, the crew approaches them for photo-identification and behavioral focal follows.


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WORKING WITH THE GITGA'AT PEOPLE
British Columbia's coastal First Nations have a close relationship with whales. Whale fins and spouts were once a common sight along the forested and rocky coasts where the Gitga'at made their home. These were the guardians who kept the knowledge of the spectacular white 'spirit bears' from early fur trappers. But commercial whaling ships couldn't be stopped. For more than four decades, the Great Bear Fjordland was completely emptied of whales. Now as hunting has slowed, whales are returning to this coast in historic numbers. Whale activity in the Great Bear Fjordland may now look much like it did two hundred years ago. It hasn't been possible to see whales behaving this way since before the 1800s. The Gitga'at have continued their role as stewards in their spectacular home. By teaming up with Captain Keen and the North Coast Cetacean Society to establish their own system of world-class oceanographic monitoring, they have made the Bangarang Project an extension of their long history in the fjords. The RV Bangarang is like a time machine - but with the threat of oil tankers on the way, her window may be brief.
MORE ABOUT THE GITGA'AT NATION


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NORTH COAST CETACEAN SOCIETY
For Whales has one purpose, to protect and research whales along the coast of BC. In 2001 For Whales established Cetacea Lab, a land based whale research station located at Whale Point on the southern end of Gil Island. Since that time they have contributed to the conclusion that this location needs to be established as Critical Habitat for Humpback Whales and as a candidate for Critical Habitat for Killer Whales.
FOR WHALES WEBSITE ›
Over the course of 3 field seasons, Eric and his small team have worked in collaboration with the North Coast Cetacean Society to conduct visual, acoustic, and oceanographic surveys in a study area that spans an area over 1200 square kilometers (of semi-enclosed fjordland).


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WHALE FEEDING CALL ▶

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FILMING THE 2015 SEASON

This August, filmmaker Luke Padgett will head out with Eric and his team on the final leg of their 3-year research expedition in the Great Bear Fjordlands. OMI is excited to be working with Luke and the Bangarang crew to produce a film that explores this place -- fierce in its magnificence, yet fragile in its very nature. In this pristine coastal realm, the ancient is not only alive – it is life-giving. And to touch it, you have to get your feet wet and taste the rain.

As we step aboard the Bangarang and sail the maze of inlets through this last great wilderness, we enter a world where porpoises arc through the water like curved light and wolves share their songs with the whales. And out there between the snow-bright summits and the jade-green fjords, we find a rich and vibrant ecosystem that has been shaped by the patient forces of time, defined by all those who inhabit it . . . and is now on the cusp of colossal change.

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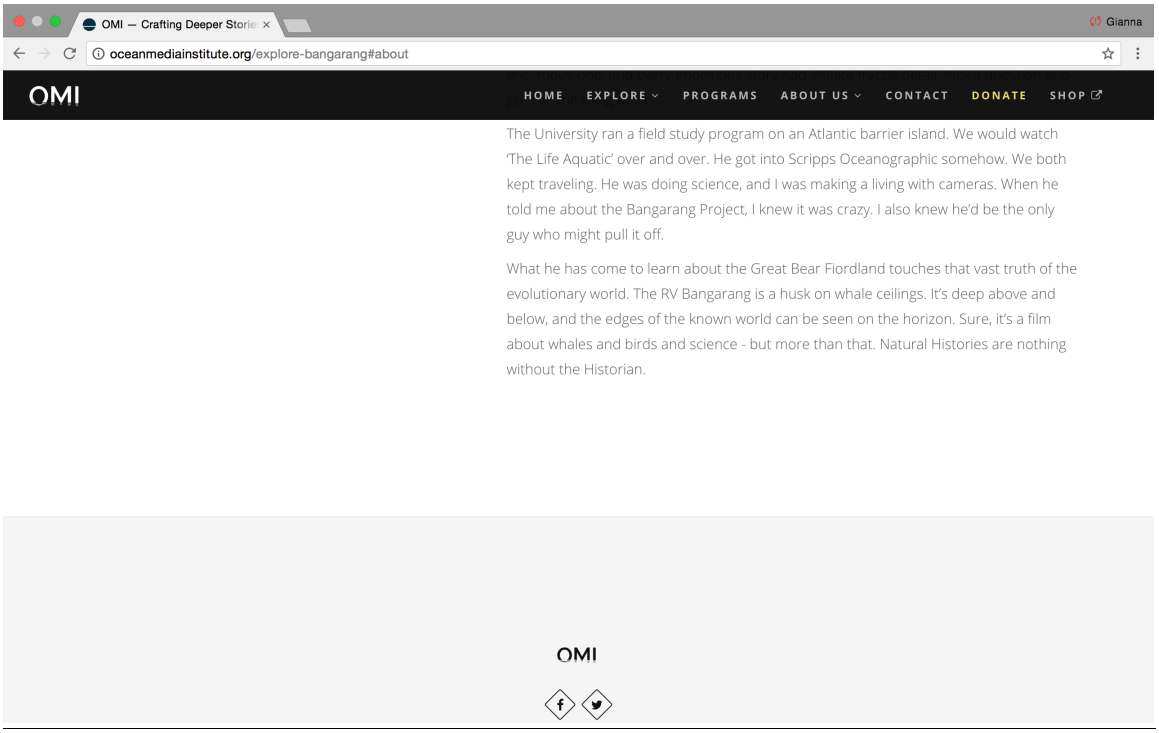
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A NOTE FROM THE FILMMAKER

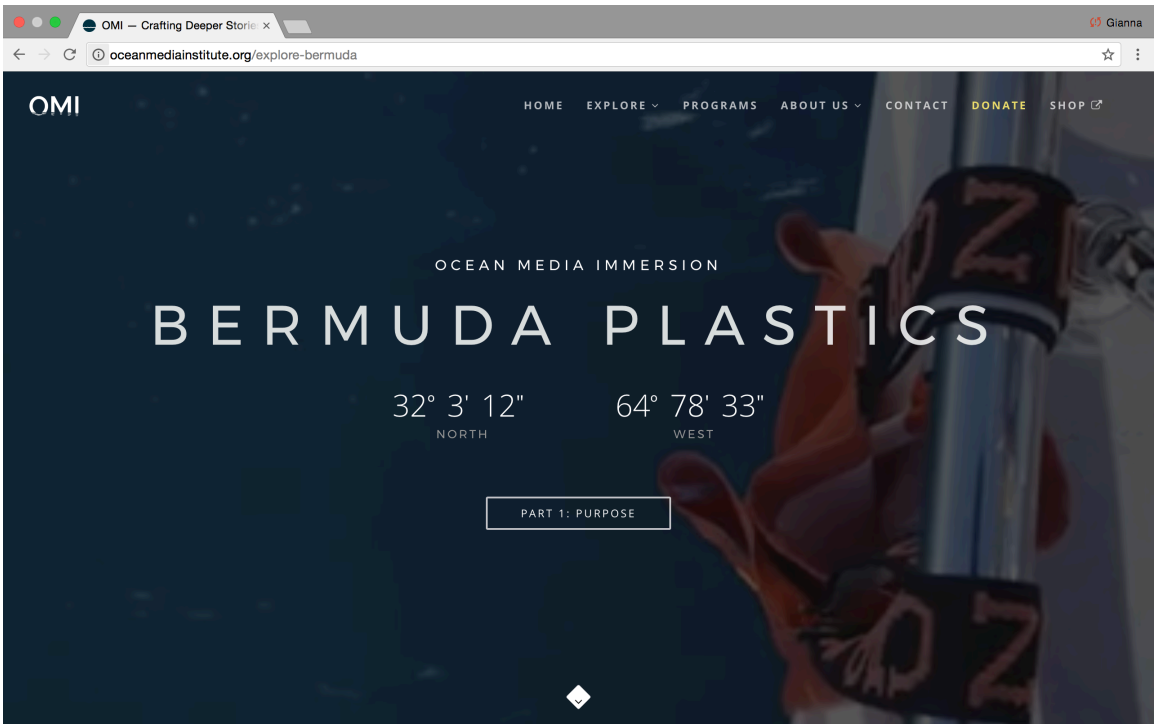


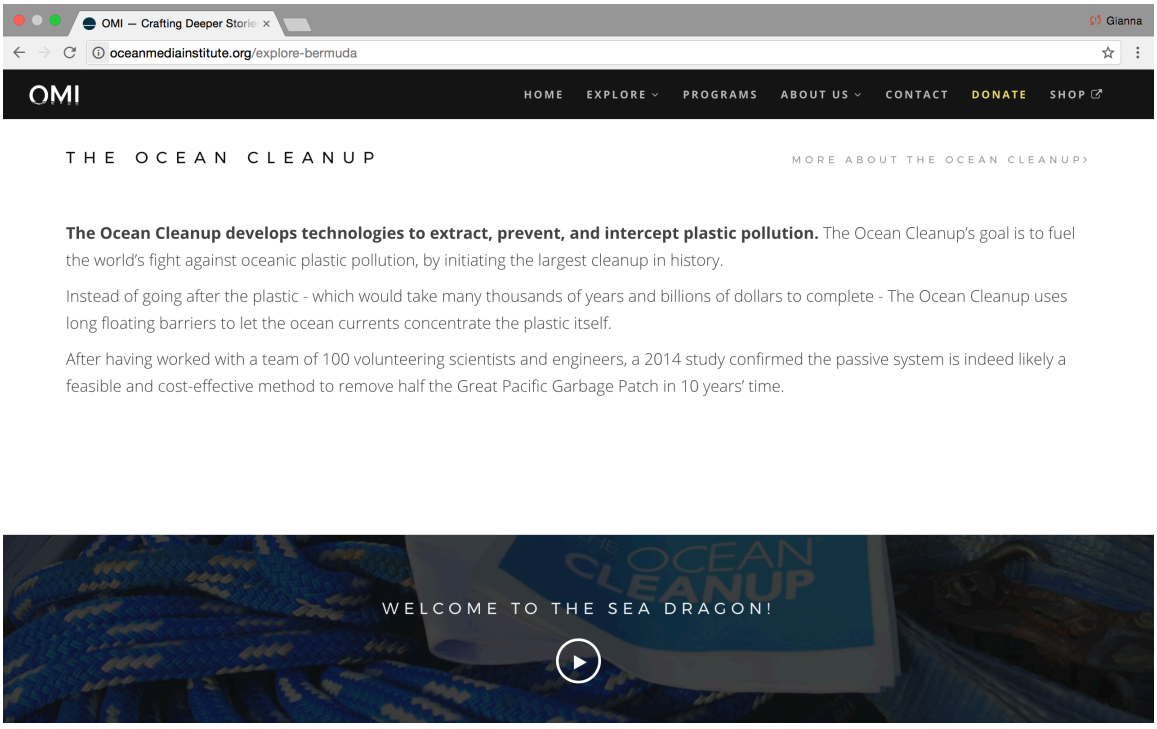
The University was small and landlocked. Eric showed up carrying a giant paddle with a face painted on it. I hated him. It wasn't long before we were traveling together. We packed about a pound of grape nuts and went to Puerto Rico to eat nothing but that for about 52 hours while we circumnavigated the island in a tiny white rental car crammed full of nets and jars for our growing insect collection. We would jump out to chase unknown butterflies and weird beetles, we drank from whole coconuts and slept in the front seats. We shot a film about it that I hope nobody ever watches again. Best thanksgiving break ever.

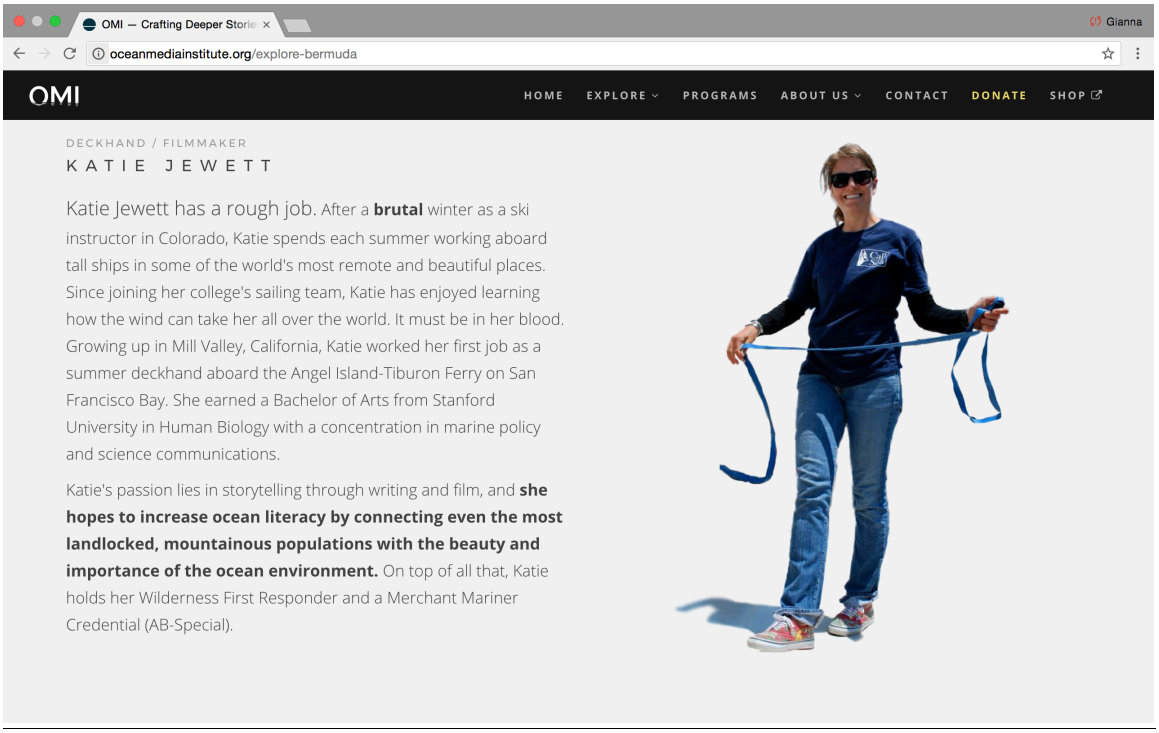
By then, I realized that Eric was developing into a serious scientist, maybe just because he had more curious energy than anyone else and no understanding of the word 'impossible.' He was a Comparative Religion major, I was in Geology. We had a group called the Sewanee Natural History Society. The philosophy of real scientific narrative amounted to a religion all its own. To us, it seemed perfectly tuned to inspire infinite awe and give physical tasks to young impetuous curiosity. When you were out in the world, there was something to look for. Every tiny evolutionary story had a place in an enormous one, and every enormous story had infinite fractal detail. Pick a question and go. The meaning of life.

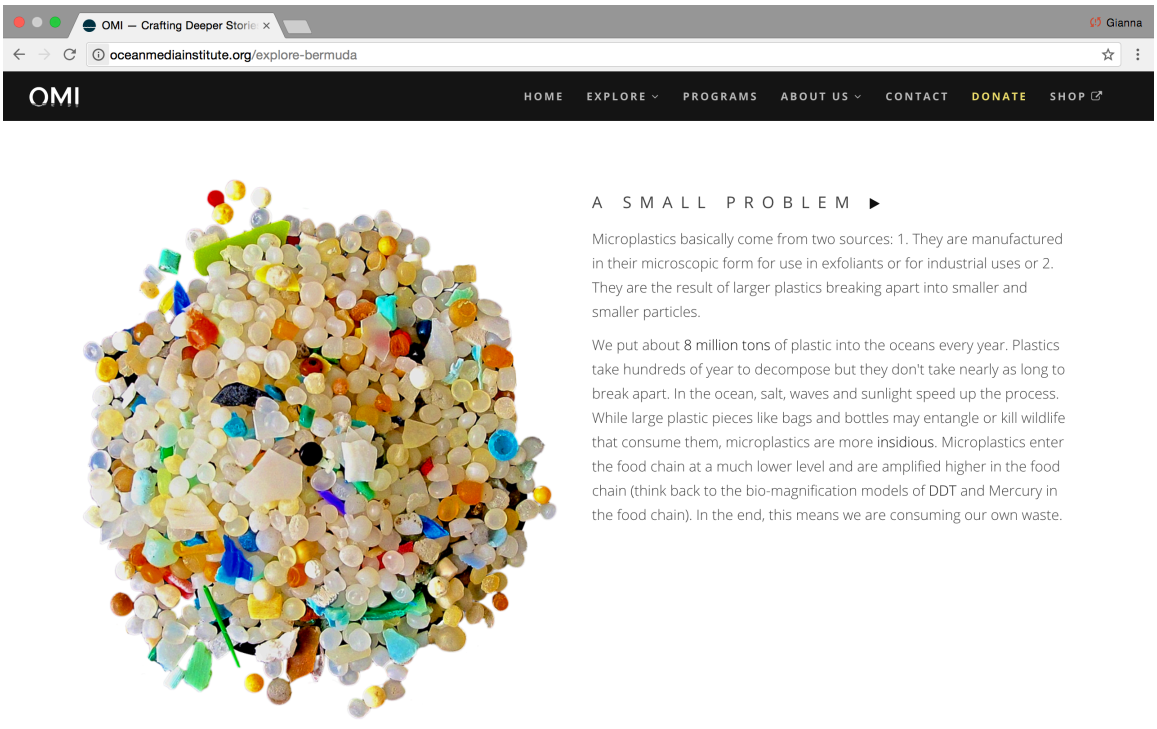

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The University ran a field study program on an Atlantic barrier island. We would watch 'The Life Aquatic' over and over. He got into Scripps Oceanographic somehow. We both kept traveling. He was doing science, and I was making a living with cameras. When he told me about the Bangarang Project, I knew it was crazy. I also knew he'd be the only guy who might pull it off.
What he has come to learn about the Great Bear Fiordland touches that vast truth of the evolutionary world. The RV Bangarang is a husk on whale ceilings. It's deep above and below, and the edges of the known world can be seen on the horizon. Sure, it's a film about whales and birds and science - but more than that. Natural Histories are nothing without the Historian.
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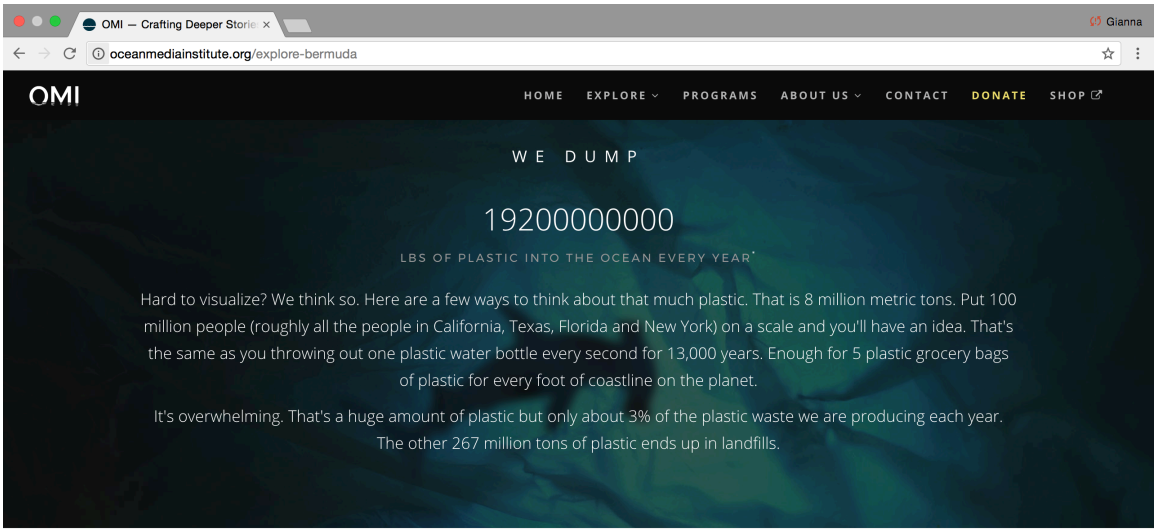
Explore: Bermuda



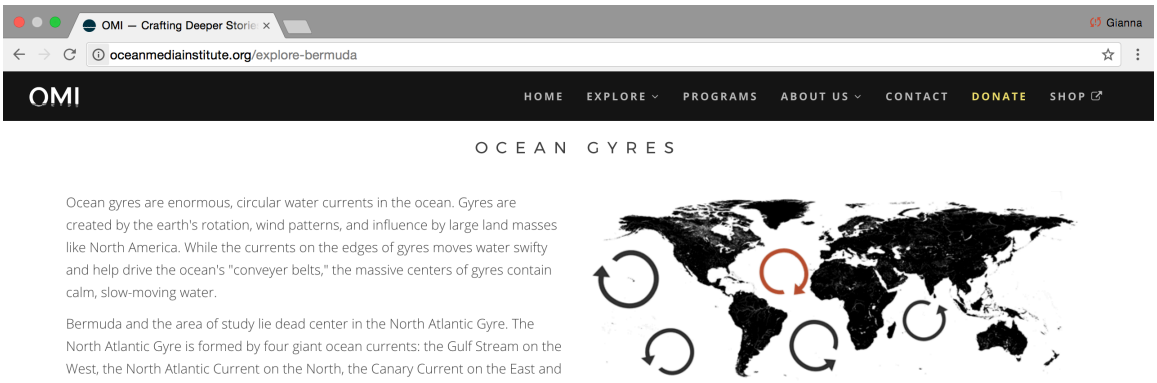


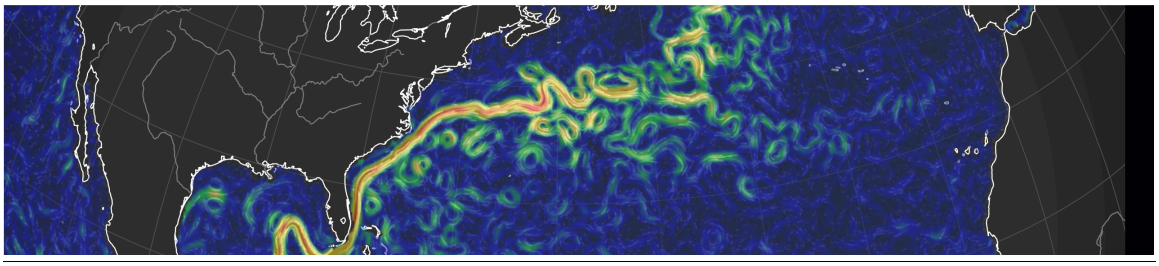

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DECKHAND / FILMMAKER
KATIE JEWETT
Katie Jewett has a rough job. After a brutal winter as a ski instructor in Colorado, Katie spends each summer working aboard tall ships in some of the world's most remote and beautiful places. Since joining her college's sailing team, Katie has enjoyed learning how the wind can take her all over the world. It must be in her blood. Growing up in Mill Valley, California, Katie worked her first job as a summer deckhand aboard the Angel Island-Tiburon Ferry on San Francisco Bay. She earned a Bachelor of Arts from Stanford University in Human Biology with a concentration in marine policy and science communications.
Katie's passion lies in storytelling through writing and film, and she hopes to increase ocean literacy by connecting even the most landlocked, mountainous populations with the beauty and importance of the ocean environment. On top of all that, Katie holds her Wilderness First Responder and a Merchant Mariner Credential (AB-Special).

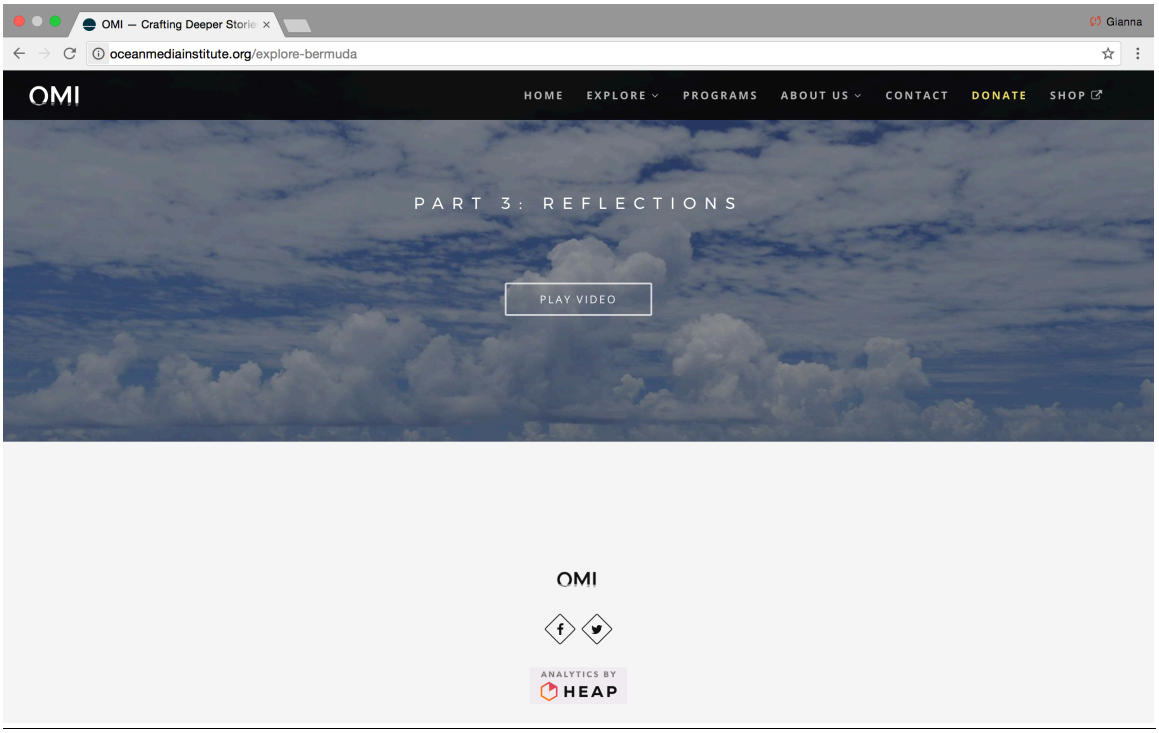

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A SMALL PROBLEM ▶
Microplastics basically come from two sources: 1. They are manufactured in their microscopic form for use in exfoliants or for industrial uses or 2. They are the result of larger plastics breaking apart into smaller and smaller particles.
We put about 8 million tons of plastic into the oceans every year. Plastics take hundreds of year to decompose but they don't take nearly as long to break apart. In the ocean, salt, waves and sunlight speed up the process. While large plastic pieces like bags and bottles may entangle or kill wildlife that consume them, microplastics are more insidious. Microplastics enter the food chain at a much lower level and are amplified higher in the food chain (think back to the bio-magnification models of DDT and Mercury in the food chain). In the end, this means we are consuming our own waste.


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WE DUMP
19200000000
LBS OF PLASTIC INTO THE OCEAN EVERY YEAR*
Hard to visualize? We think so. Here are a few ways to think about that much plastic. That is 8 million metric tons. Put 100 million people (roughly all the people in California, Texas, Florida and New York) on a scale and you'll have an idea. That's the same as you throwing out one plastic water bottle every second for 13,000 years. Enough for 5 plastic grocery bags of plastic for every foot of coastline on the planet.
It's overwhelming. That's a huge amount of plastic but only about 3% of the plastic waste we are producing each year. The other 267 million tons of plastic ends up in landfills.

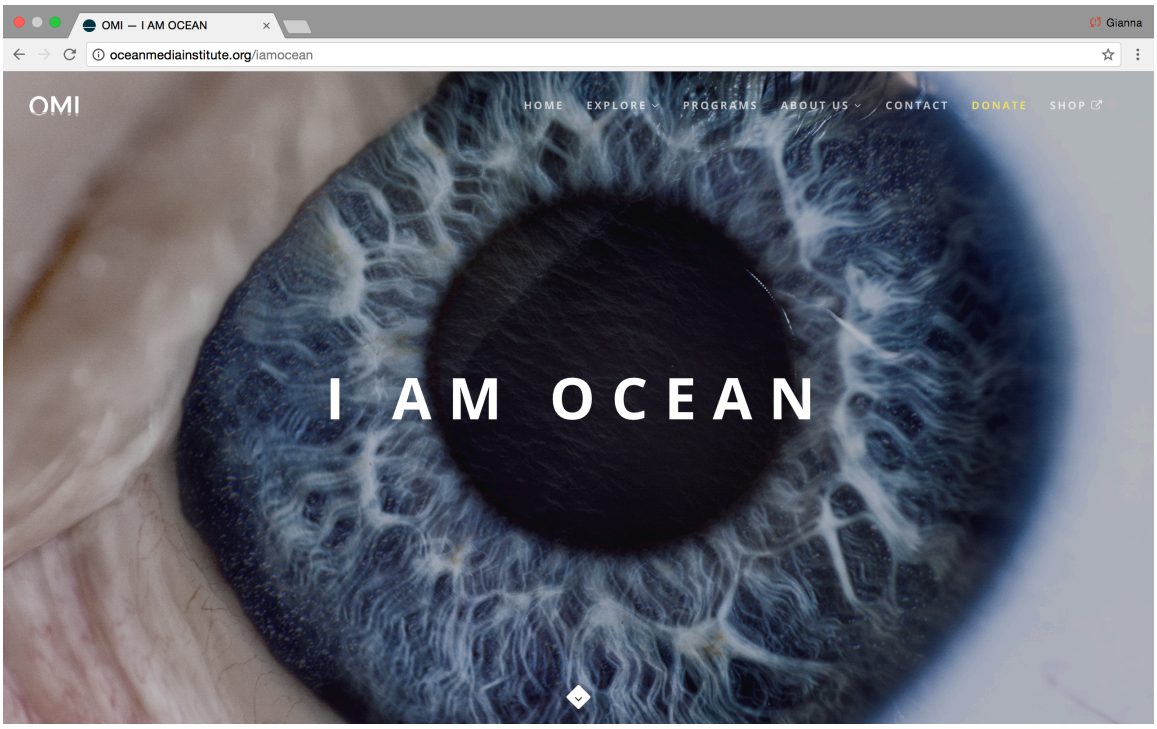

OCEAN GYRES
Ocean gyres are enormous, circular water currents in the ocean. Gyres are created by the earth's rotation, wind patterns, and influence by large land masses like North America. While the currents on the edges of gyres moves water swifty

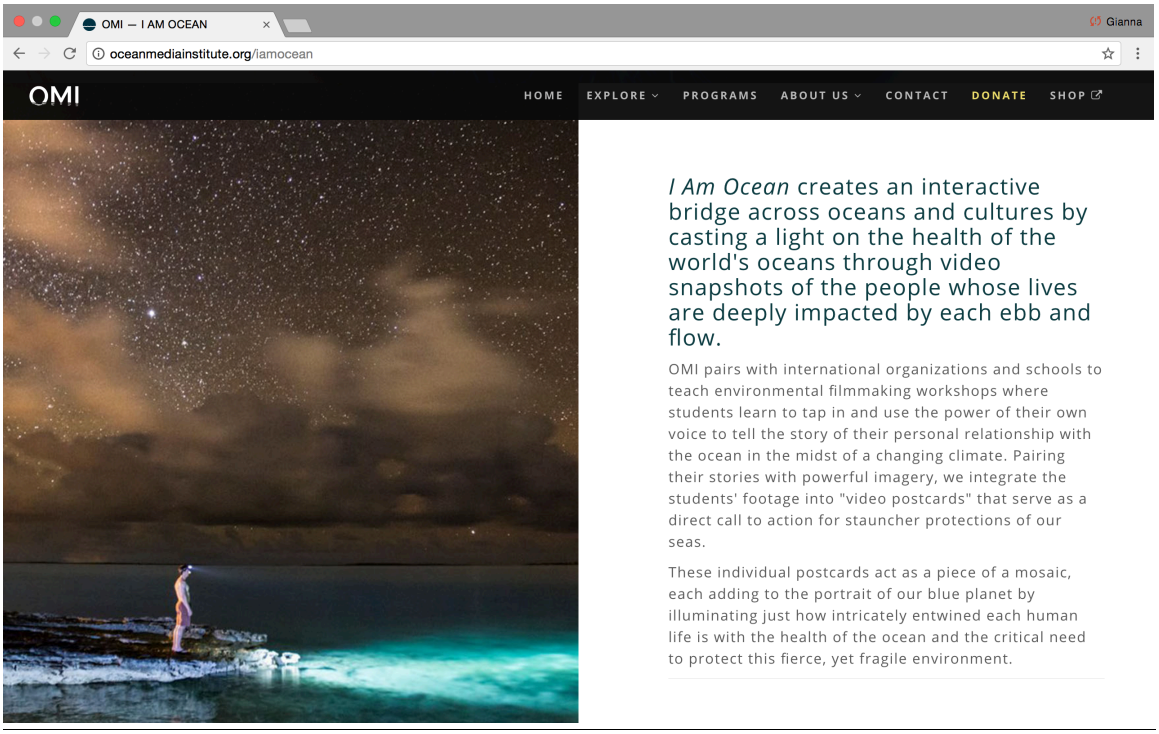

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OCEAN GYRES
Ocean gyres are enormous, circular water currents in the ocean. Gyres are created by the earth's rotation, wind patterns, and influence by large land masses like North America. While the currents on the edges of gyres moves water swifty and help drive the ocean's "conveyer belts," the massive centers of gyres contain calm, slow-moving water.
Bermuda and the area of study lie dead center in the North Atlantic Gyre. The North Atlantic Gyre is formed by four giant ocean currents: the Gulf Stream on the West, the North Atlantic Current on the North, the Canary Current on the East and the North Atlantic Equatorial Current on the South.

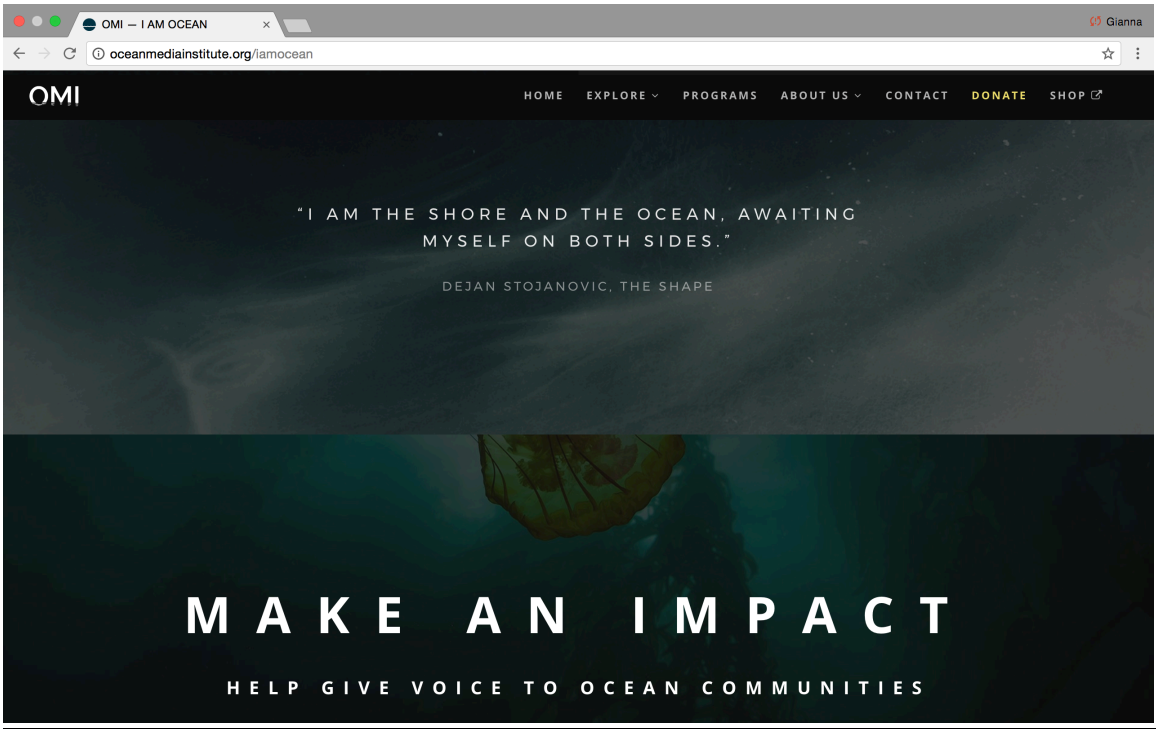


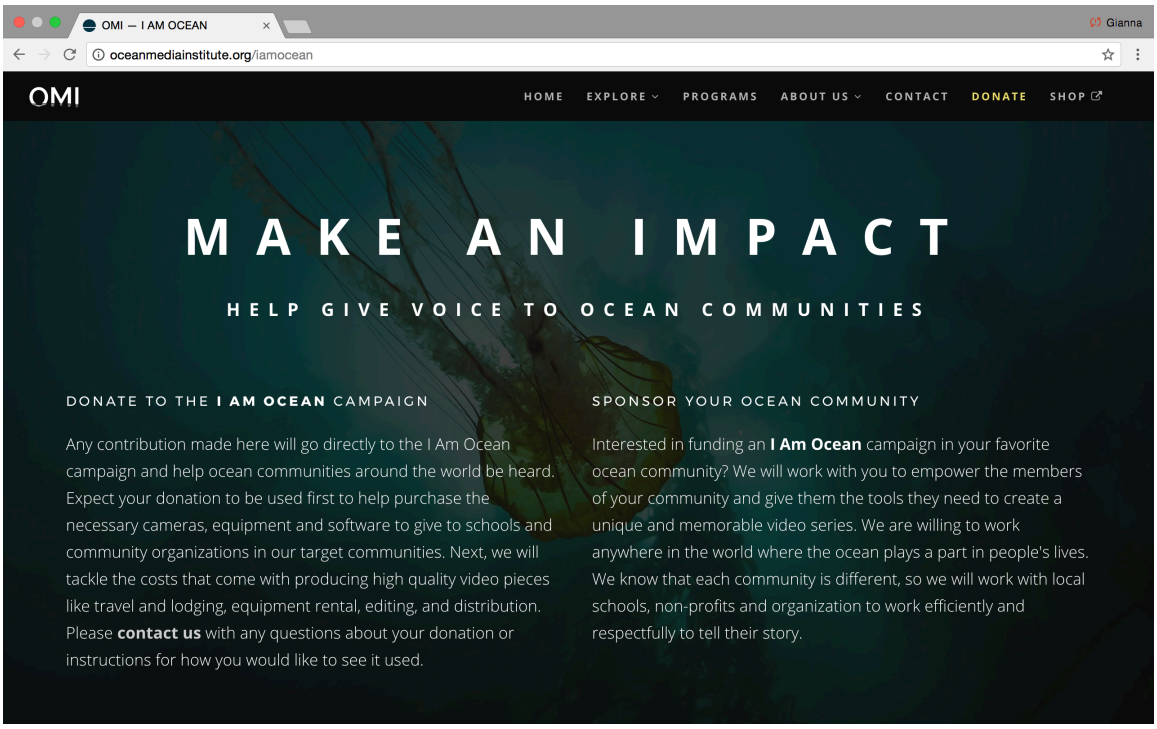

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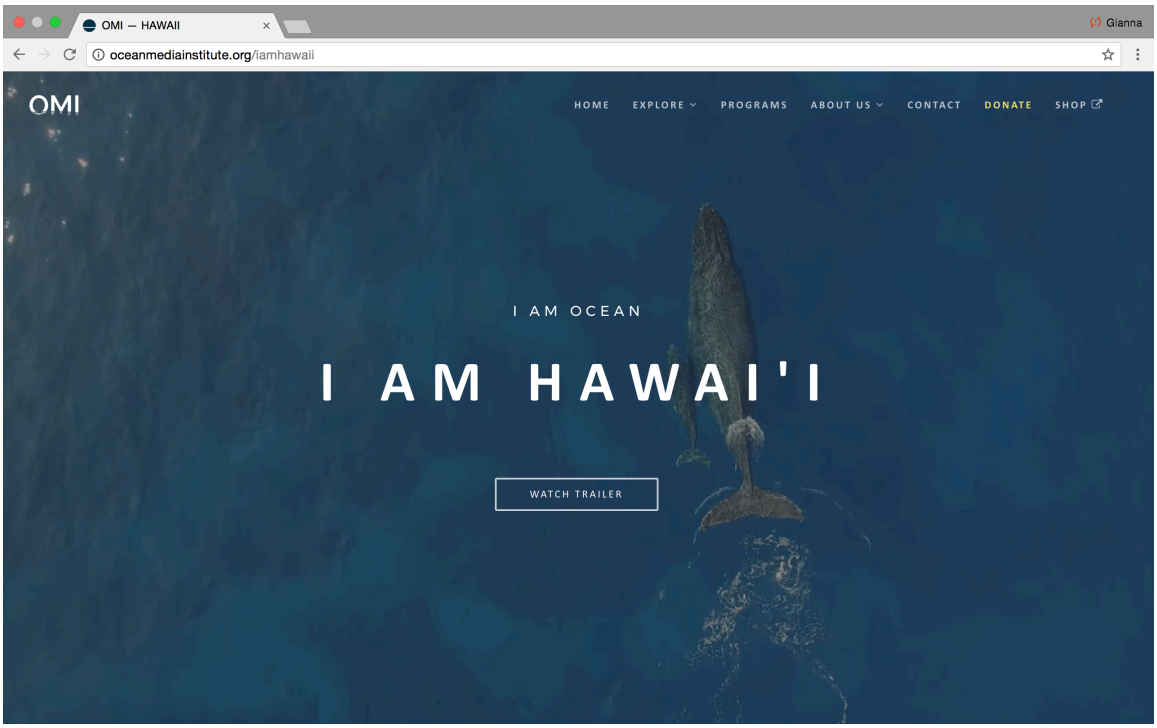


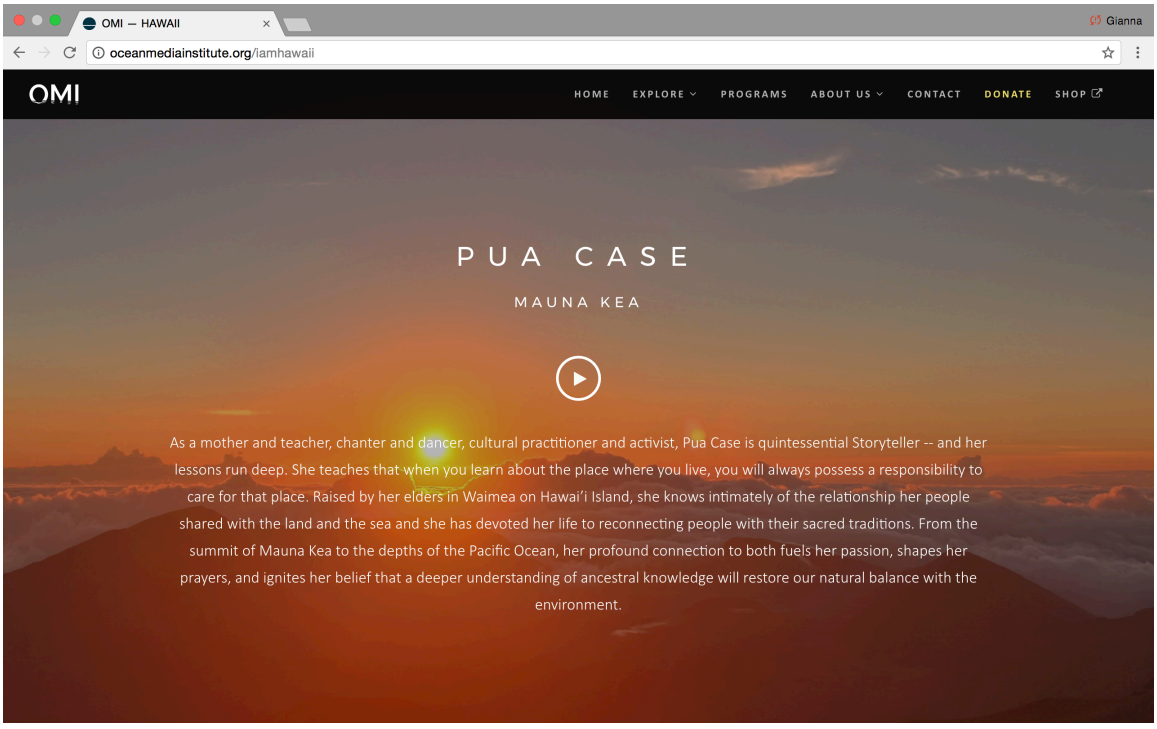


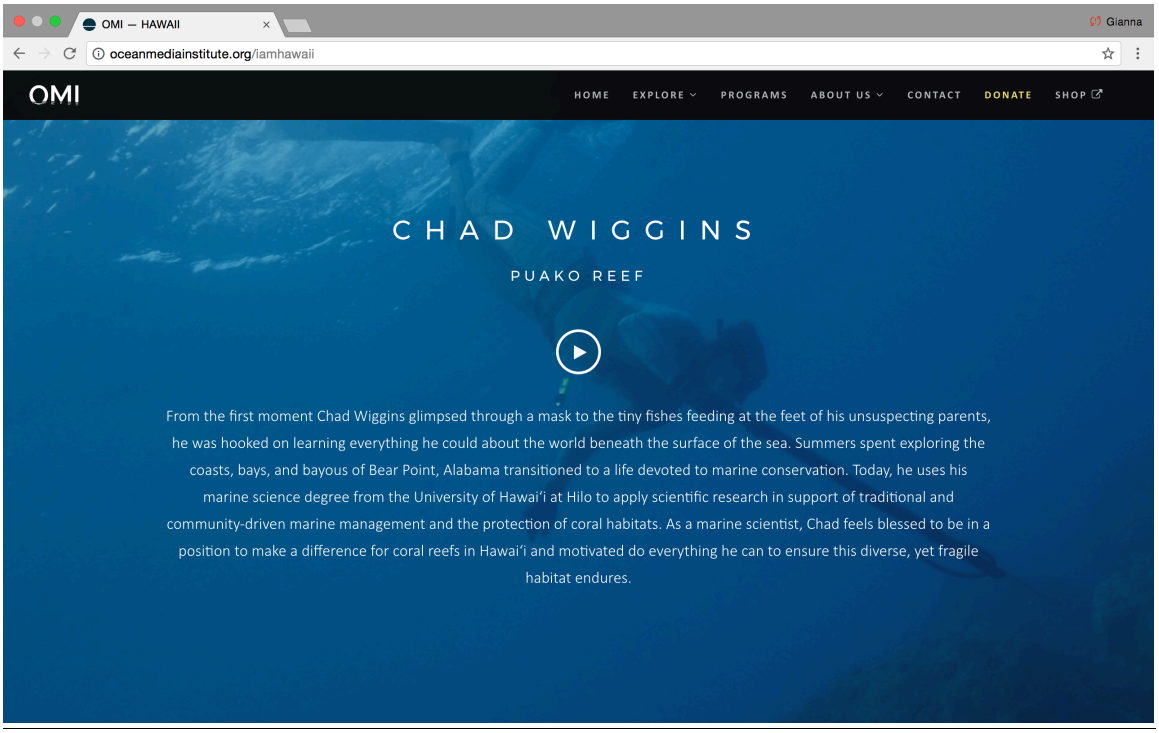

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"I AM THE SHORE AND THE OCEAN, AWAITING MYSELF ON BOTH SIDES."
DEJAN STOJANOVIC, THE SHAPE
MAKE AN IMPACT
HELP GIVE VOICE TO OCEAN COMMUNITIES

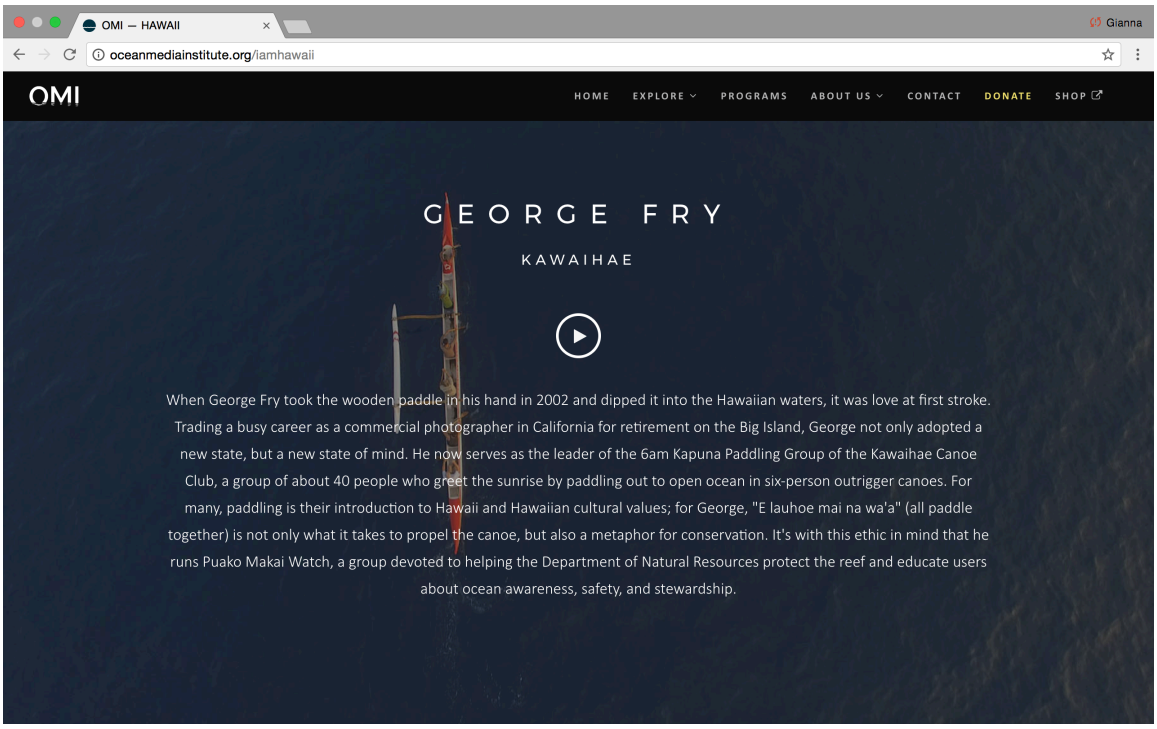

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DONATE TO THE I AM OCEAN CAMPAIGN
Any contribution made here will go directly to the I Am Ocean campaign and help ocean communities around the world be heard. Expect your donation to be used first to help purchase the necessary cameras, equipment and software to give to schools and community organizations in our target communities. Next, we will tackle the costs that come with producing high quality video pieces like travel and lodging, equipment rental, editing, and distribution. Please contact us with any questions about your donation or instructions for how you would like to see it used.
SPONSOR YOUR OCEAN COMMUNITY
Interested in funding an I Am Ocean campaign in your favorite ocean community? We will work with you to empower the members of your community and give them the tools they need to create a unique and memorable video series. We are willing to work anywhere in the world where the ocean plays a part in people's lives. We know that each community is different, so we will work with local schools, non-profits and organization to work efficiently and respectfully to tell their story.

Explore: Campaigns - I Am Hawaii

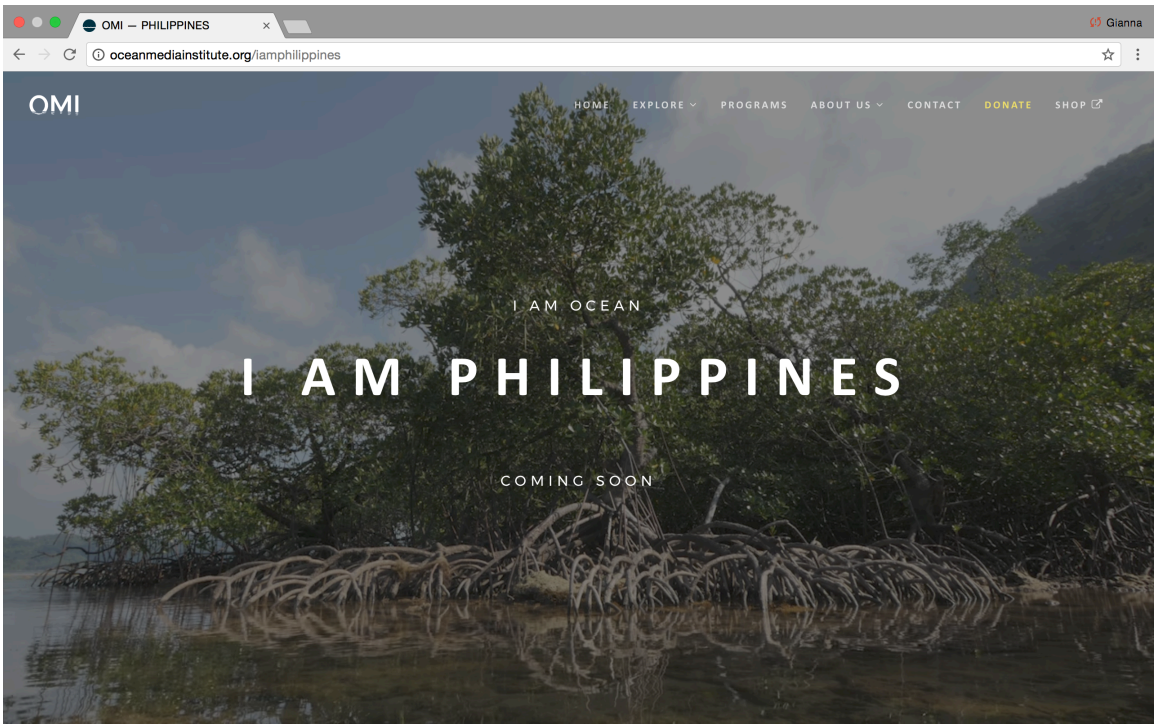


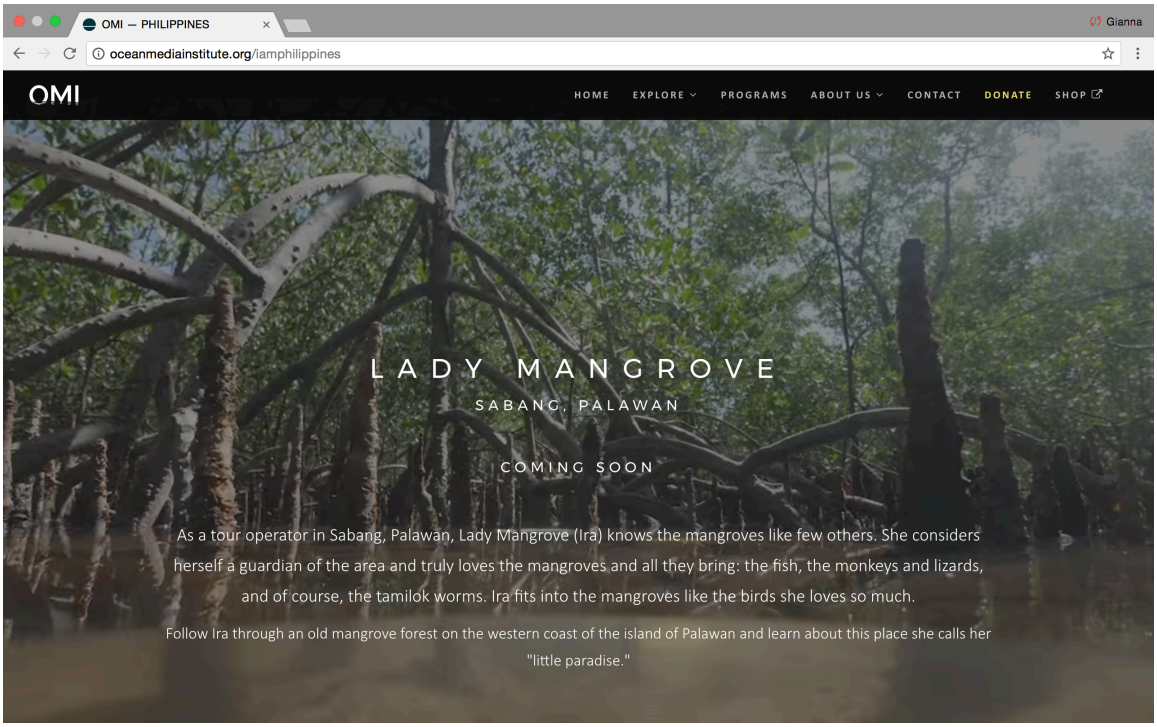


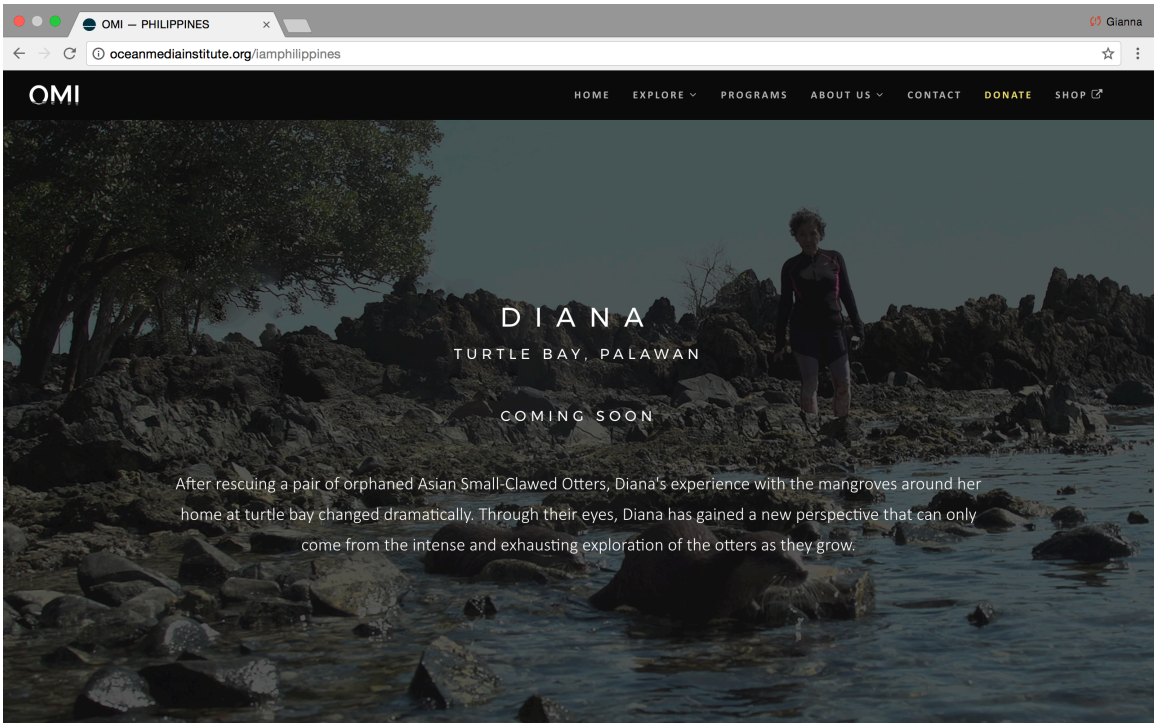

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CHAD WIGGINS
PUAKO REEF
From the first moment Chad Wiggins glimpsed through a mask to the tiny fishes feeding at the feet of his unsuspecting parents, he was hooked on learning everything he could about the world beneath the surface of the sea. Summers spent exploring the coasts, bays, and bayous of Bear Point, Alabama transitioned to a life devoted to marine conservation. Today, he uses his marine science degree from the University of Hawai'i at Hilo to apply scientific research in support of traditional and community-driven marine management and the protection of coral habitats. As a marine scientist, Chad feels blessed to be in a position to make a difference for coral reefs in Hawai'i and motivated do everything he can to ensure this diverse, yet fragile habitat endures.

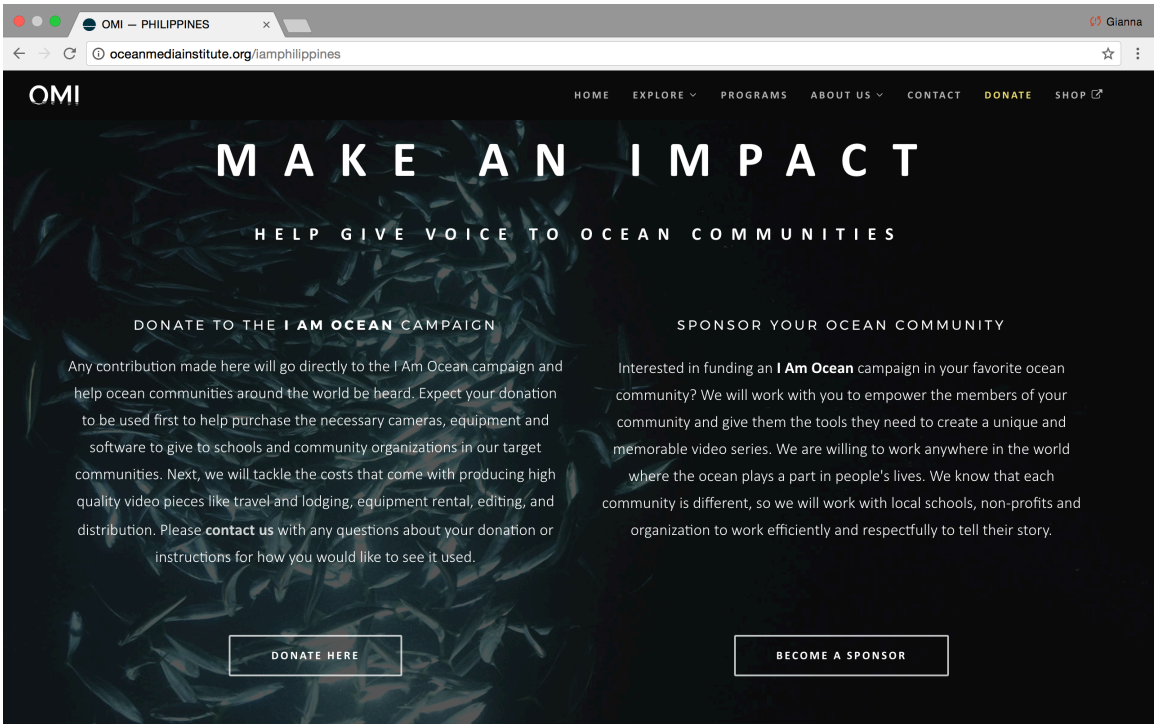

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GEORGE FRY
KAWAIHAE
When George Fry took the wooden paddle in his hand in 2002 and dipped it into the Hawaiian waters, it was love at first stroke. Trading a busy career as a commercial photographer in California for retirement on the Big Island, George not only adopted a new state, but a new state of mind. He now serves as the leader of the 6am Kapuna Paddling Group of the Kawaihae Canoe Club, a group of about 40 people who greet the sunrise by paddling out to open ocean in six-person outrigger canoes. For many, paddling is their introduction to Hawaii and Hawaiian cultural values; for George, "E lauhoe mai na wa'a" (all paddle together) is not only what it takes to propel the canoe, but also a metaphor for conservation. It's with this ethic in mind that he runs Puako Makai Watch, a group devoted to helping the Department of Natural Resources protect the reef and educate users about ocean awareness, safety, and stewardship.

Explore: Campaigns - I Am Philippines

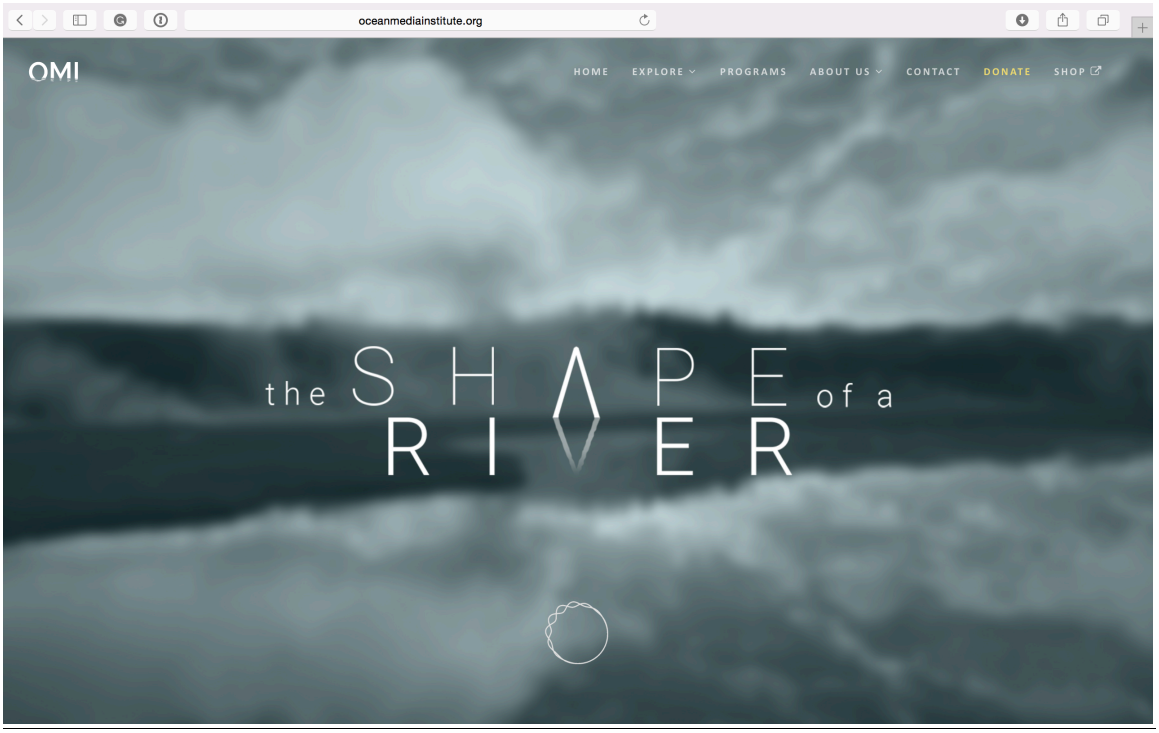


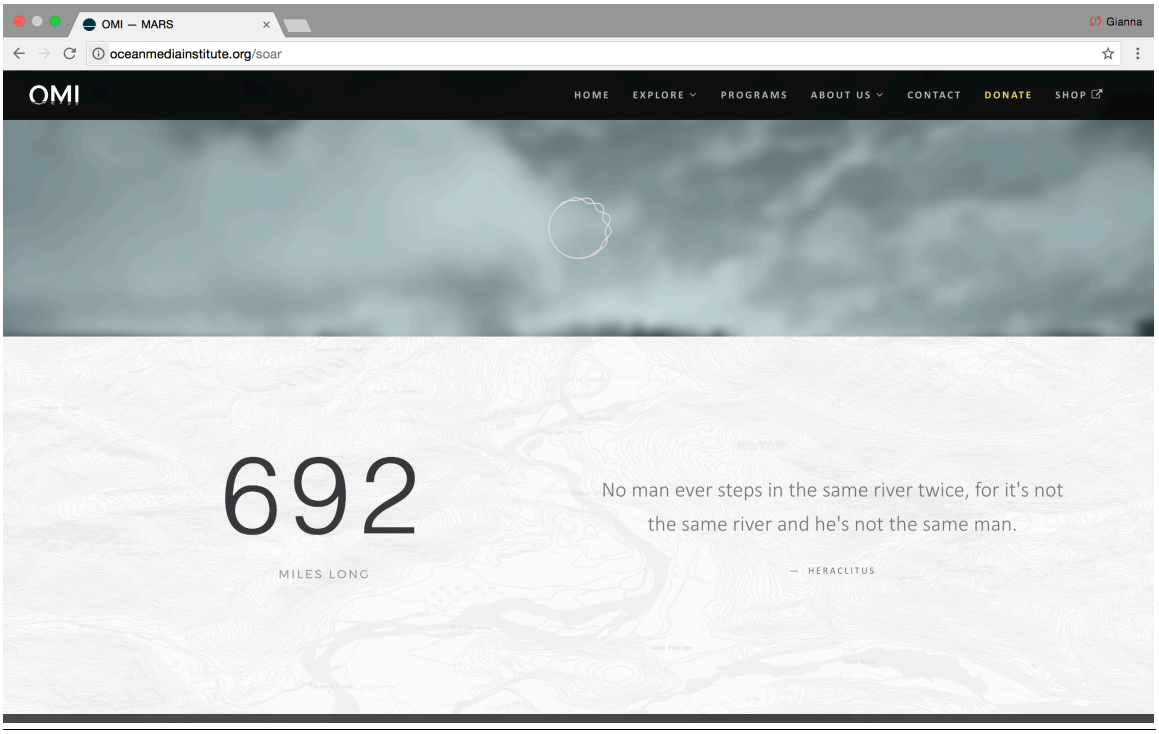


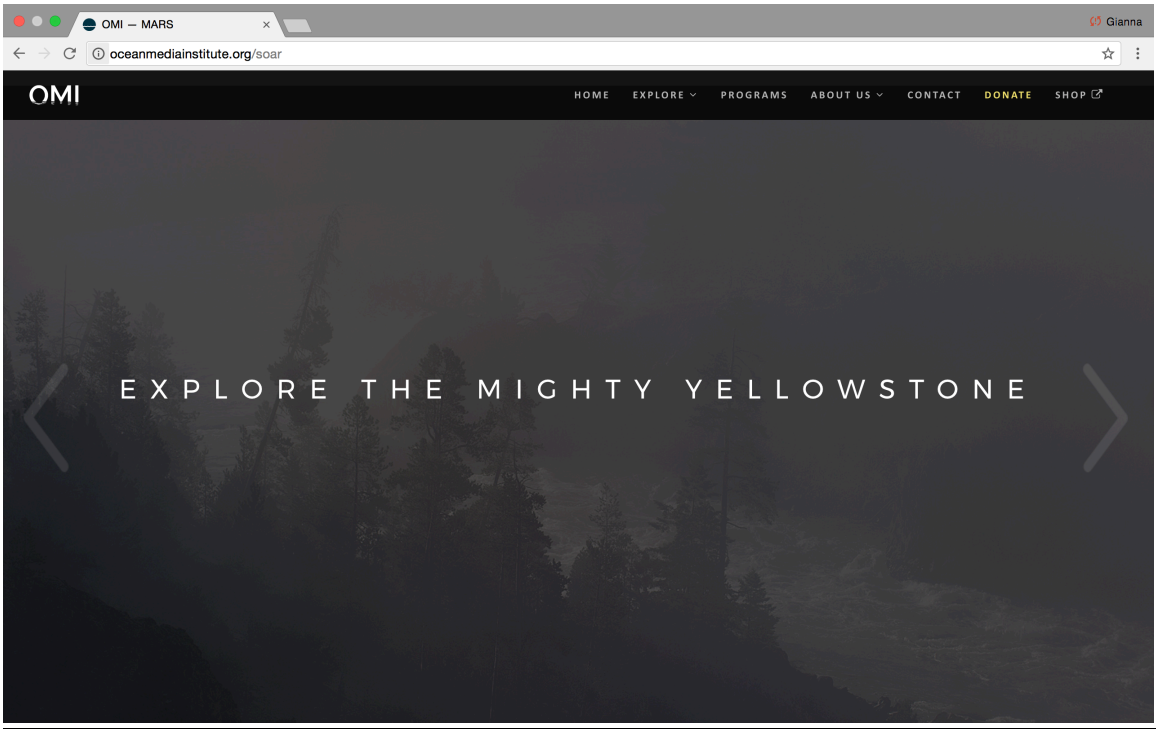

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DIANA
TURTLE BAY, PALAWAN
COMING SOON
After rescuing a pair of orphaned Asian Small-Clawed Otters, Diana's experience with the mangroves around her home at turtle bay changed dramatically. Through their eyes, Diana has gained a new perspective that can only come from the intense and exhausting exploration of the otters as they grow.

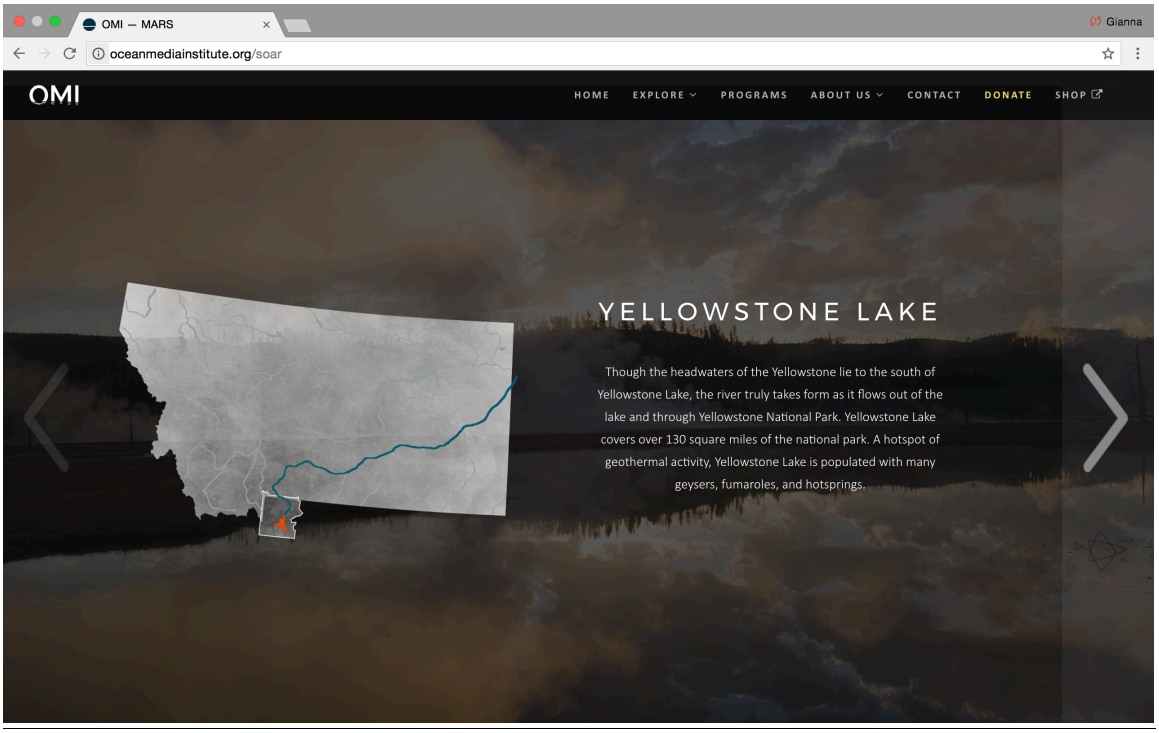

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Any contribution made here will go directly to the I Am Ocean campaign and help ocean communities around the world be heard. Expect your donation to be used first to help purchase the necessary cameras, equipment and software to give to schools and community organizations in our target communities. Next, we will tackle the costs that come with producing high quality video pieces like travel and lodging, equipment rental, editing, and distribution. Please contact us with any questions about your donation or instructions for how you would like to see it used.
DONATE HERE
SPONSOR YOUR OCEAN COMMUNITY
Interested in funding an I Am Ocean campaign in your favorite ocean community? We will work with you to empower the members of your community and give them the tools they need to create a unique and memorable video series. We are willing to work anywhere in the world where the ocean plays a part in people's lives. We know that each community is different, so we will work with local schools, non-profits and organization to work efficiently and respectfully to tell their story.
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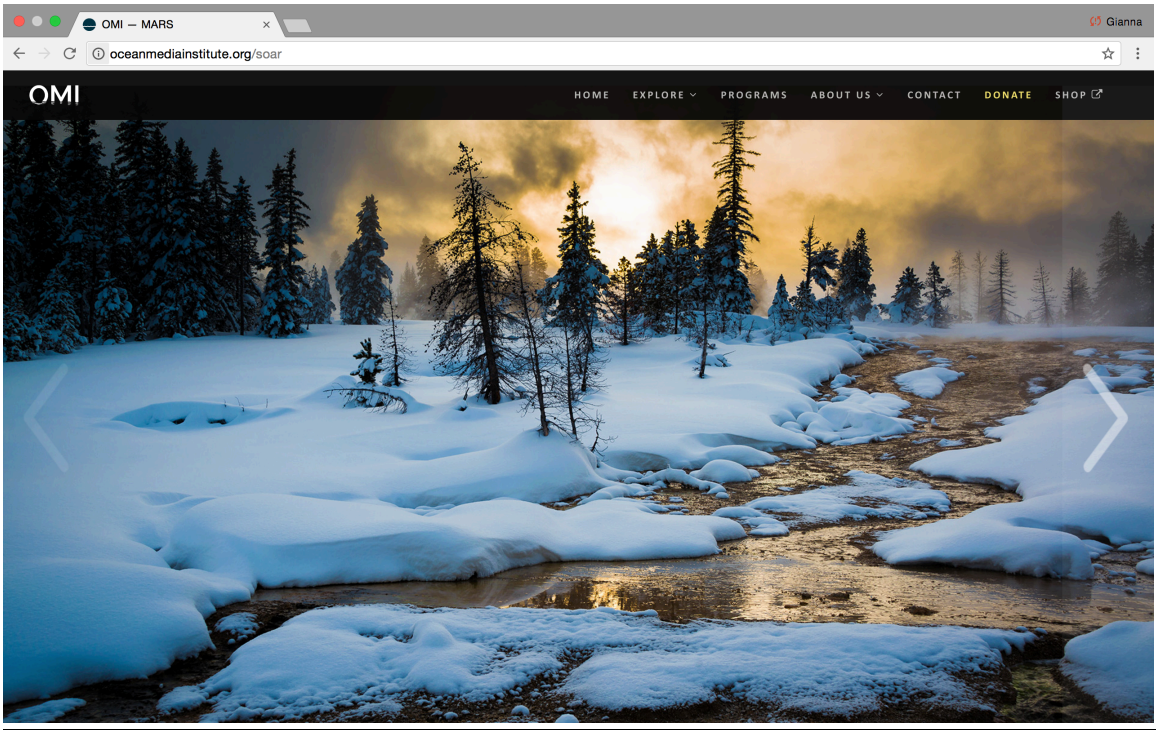
Explore: Projects - The Shape of a River

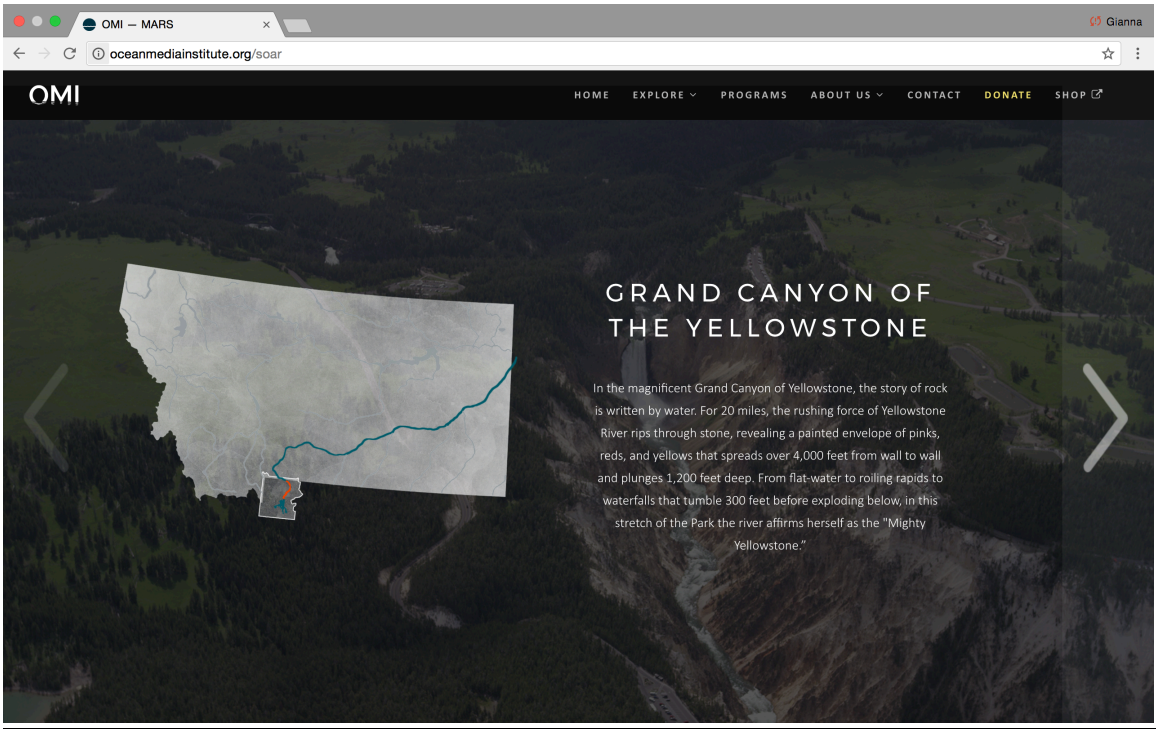


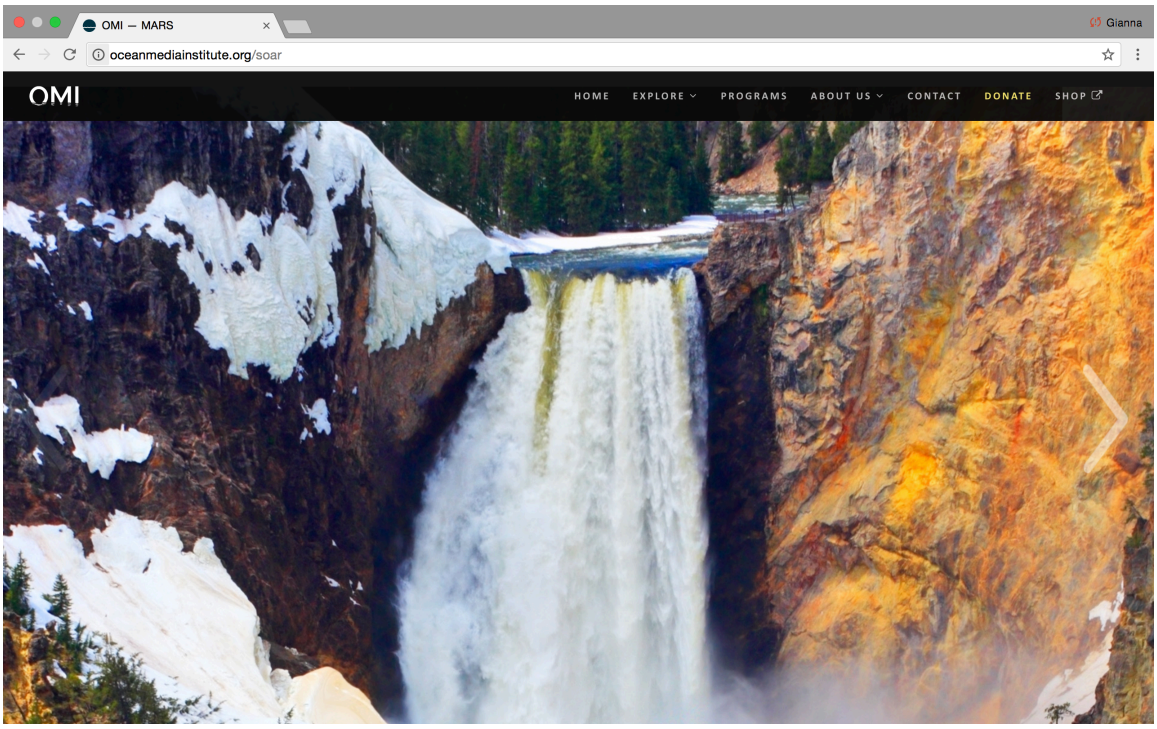


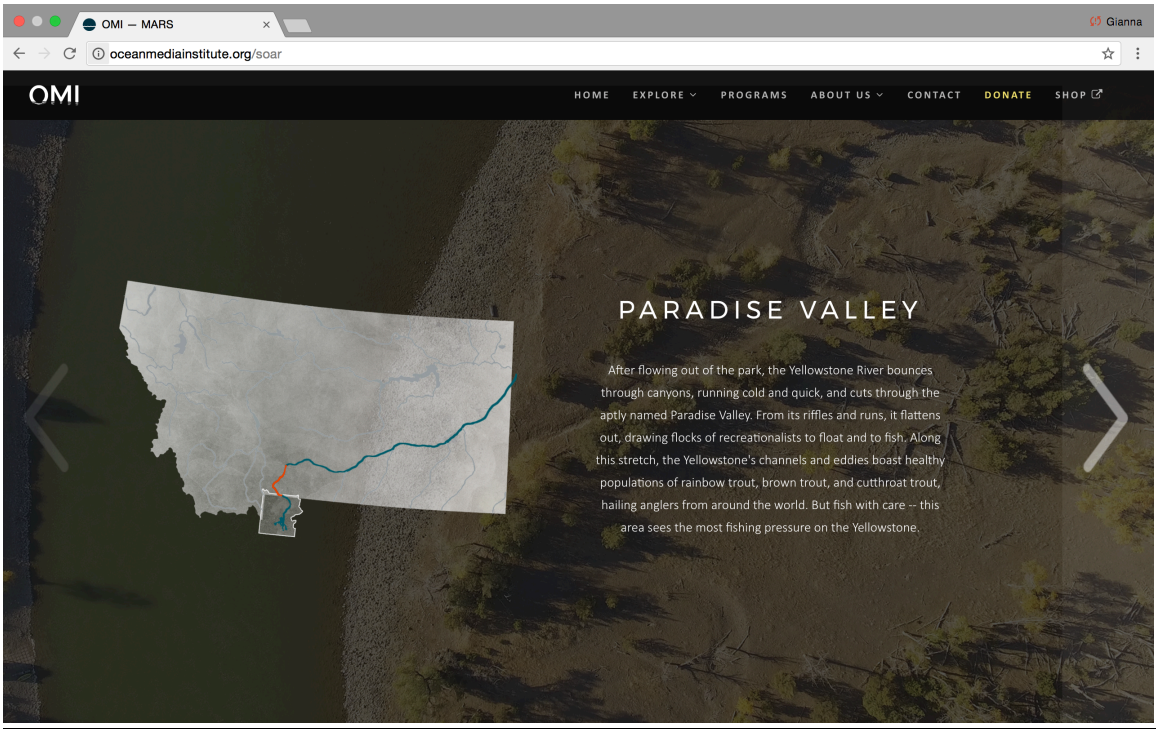

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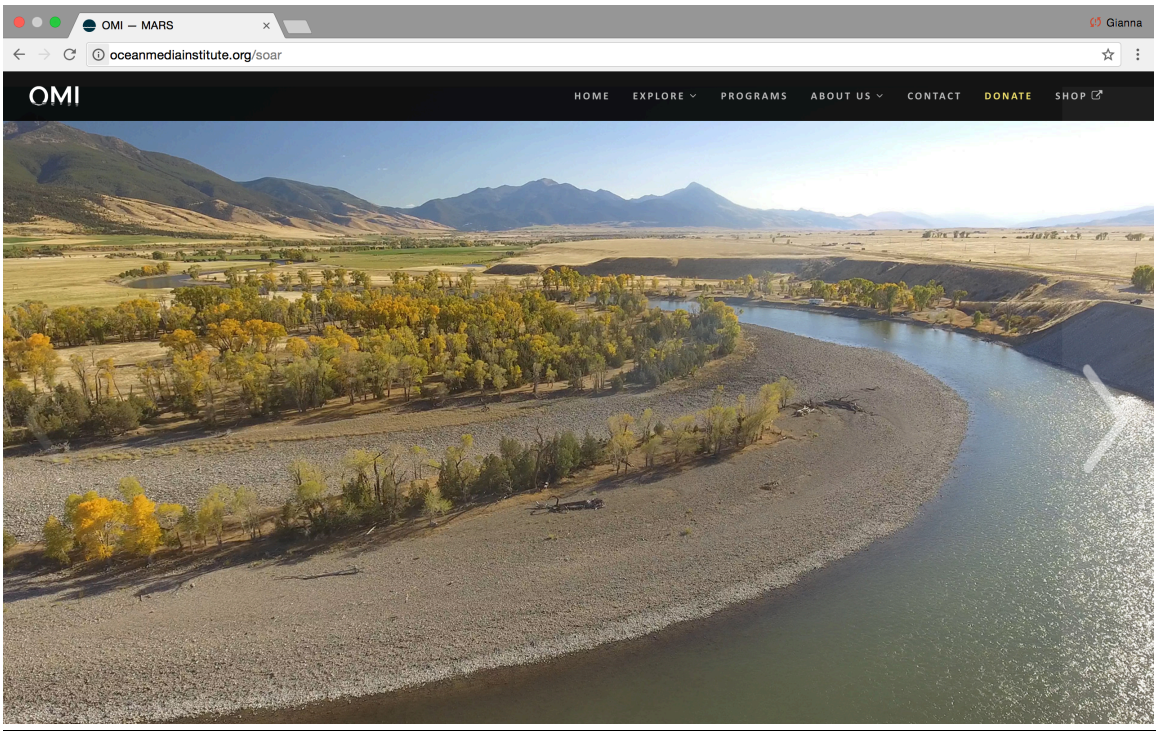

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YELLOWSTONE LAKE
Though the headwaters of the Yellowstone lie to the south of Yellowstone Lake, the river truly takes form as it flows out of the lake and through Yellowstone National Park. Yellowstone Lake covers over 130 square miles of the national park. A hotspot of geothermal activity, Yellowstone Lake is populated with many geysers, fumaroles, and hotsprings.

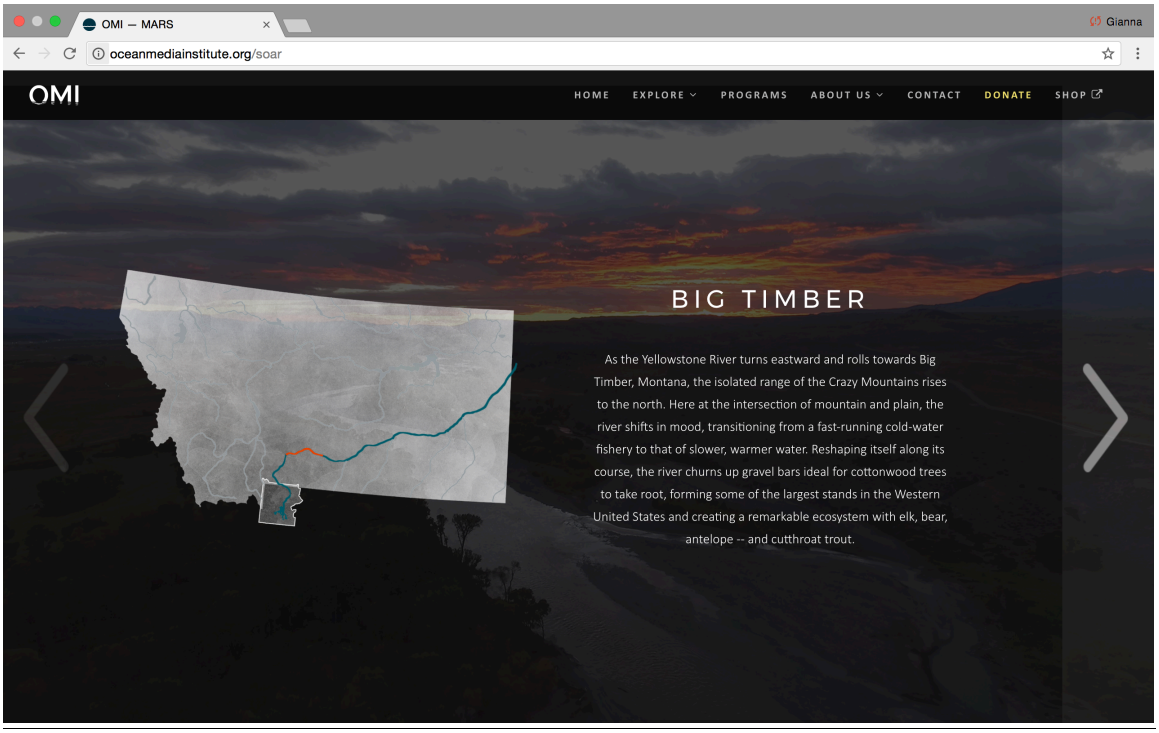

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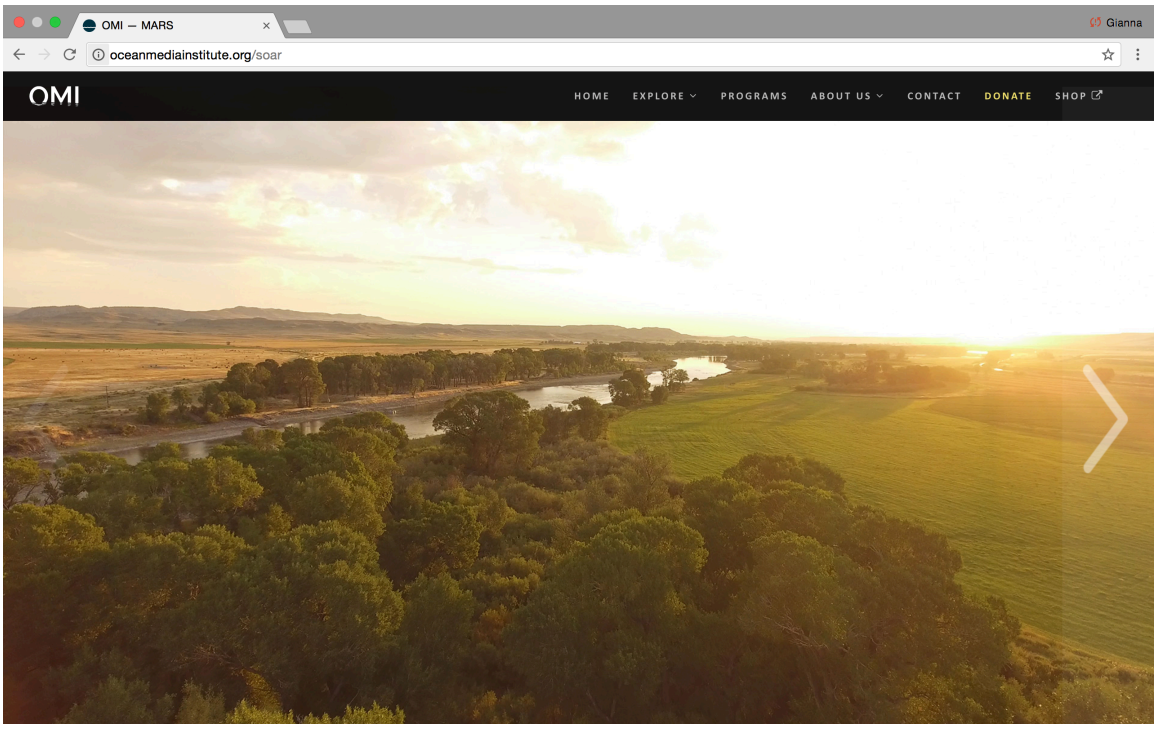

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GRAND CANYON OF THE YELLOWSTONE
In the magnificent Grand Canyon of Yellowstone, the story of rock is written by water. For 20 miles, the rushing force of Yellowstone River rips through stone, revealing a painted envelope of pinks, reds, and yellows that spreads over 4,000 feet from wall to wall and plunges 1,200 feet deep. From flat-water to roiling rapids to waterfalls that tumble 300 feet before exploding below, in this stretch of the Park the river affirms herself as the "Mighty Yellowstone."

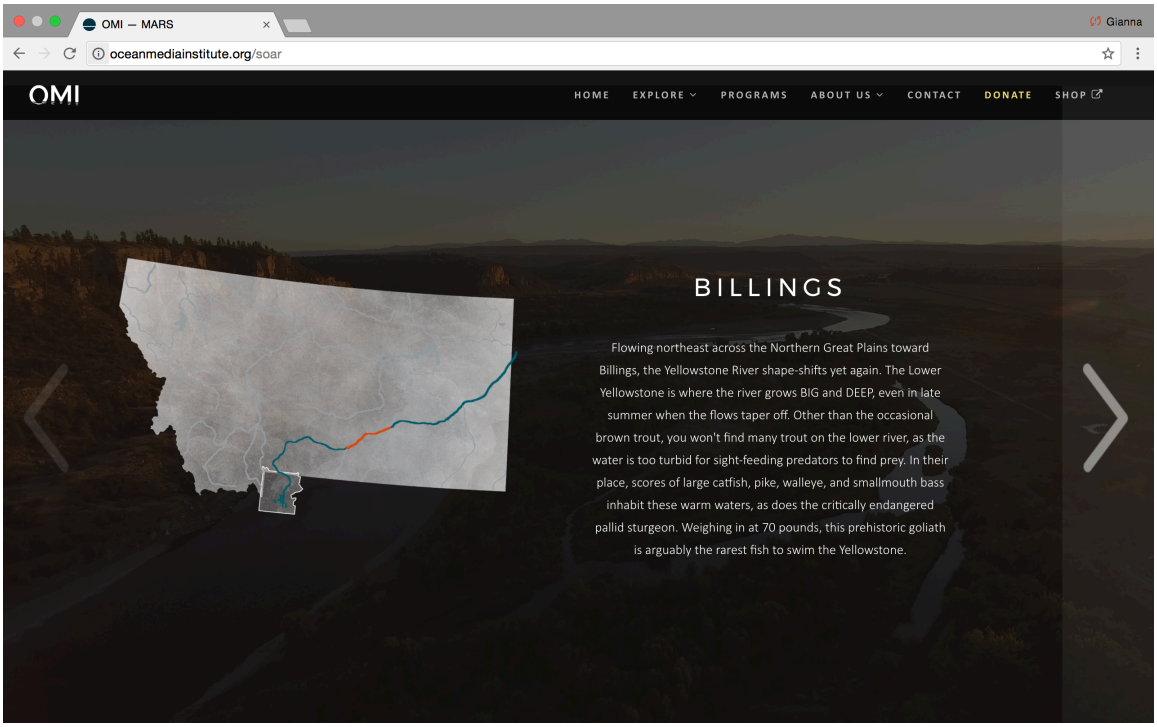

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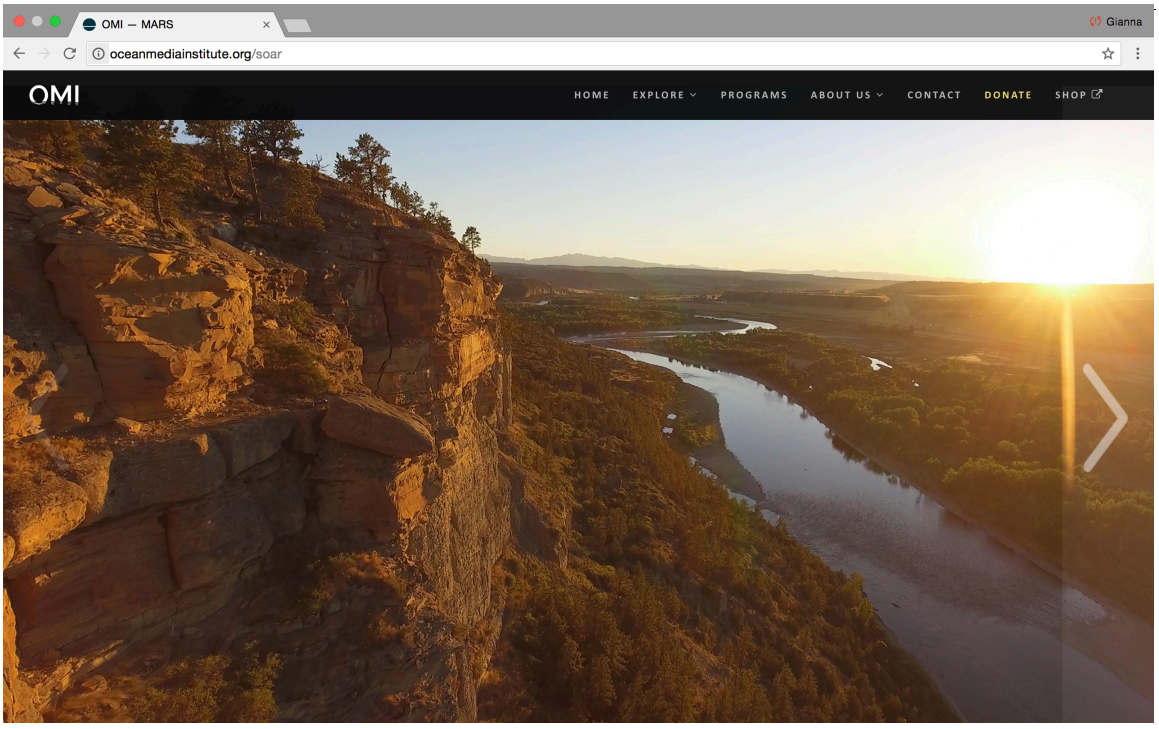

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PARADISE VALLEY
After flowing out of the park, the Yellowstone River bounces through canyons, running cold and quick, and cuts through the aptly named Paradise Valley. From its riffles and runs, it flattens out, drawing flocks of recreationalists to float and to fish. Along this stretch, the Yellowstone's channels and eddies boast healthy populations of rainbow trout, brown trout, and cutthroat trout, hailing anglers from around the world. But fish with care -- this area sees the most fishing pressure on the Yellowstone.

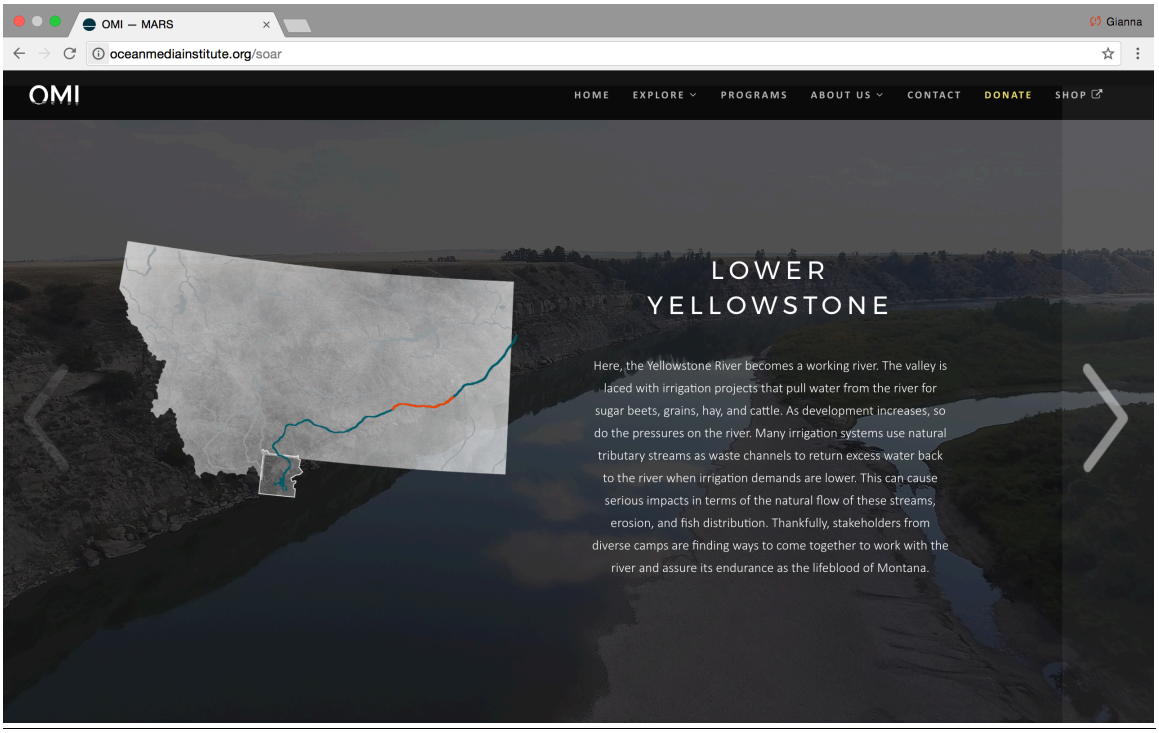

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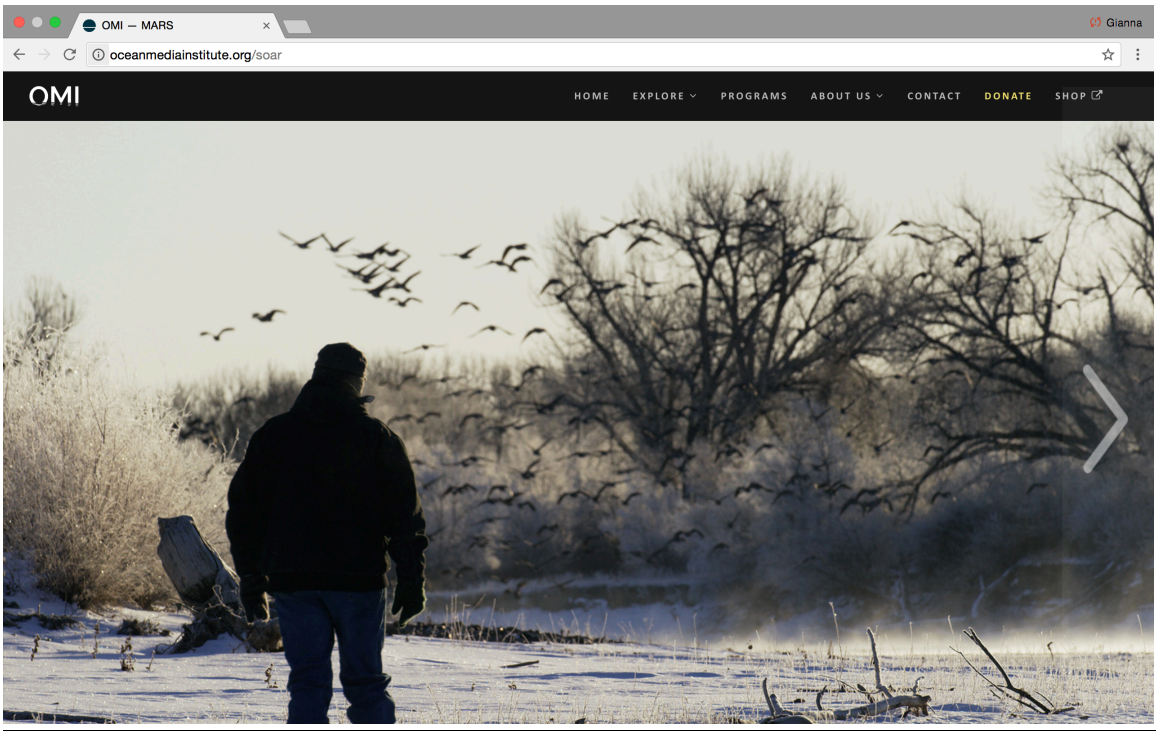

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BIG TIMBER
As the Yellowstone River turns eastward and rolls towards Big Timber, Montana, the isolated range of the Crazy Mountains rises to the north. Here at the intersection of mountain and plain, the river shifts in mood, transitioning from a fast-running cold-water fishery to that of slower, warmer water. Reshaping itself along its course, the river churns up gravel bars ideal for cottonwood trees to take root, forming some of the largest stands in the Western United States and creating a remarkable ecosystem with elk, bear, antelope -- and cutthroat trout.

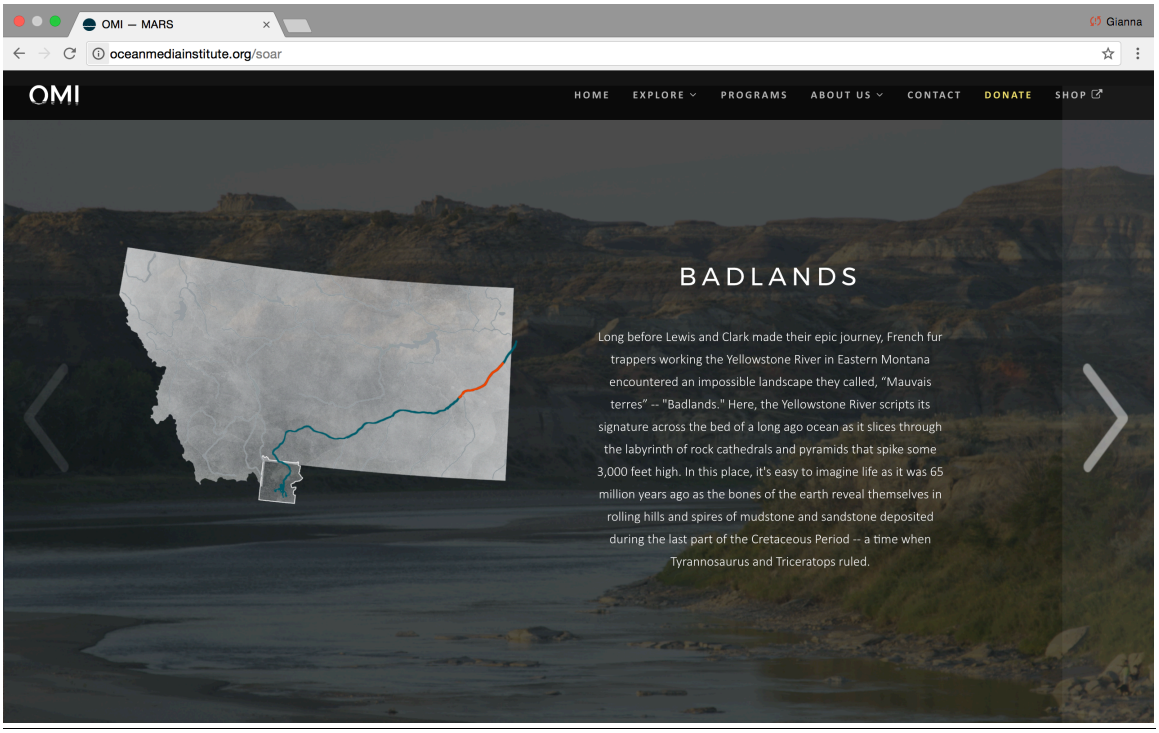

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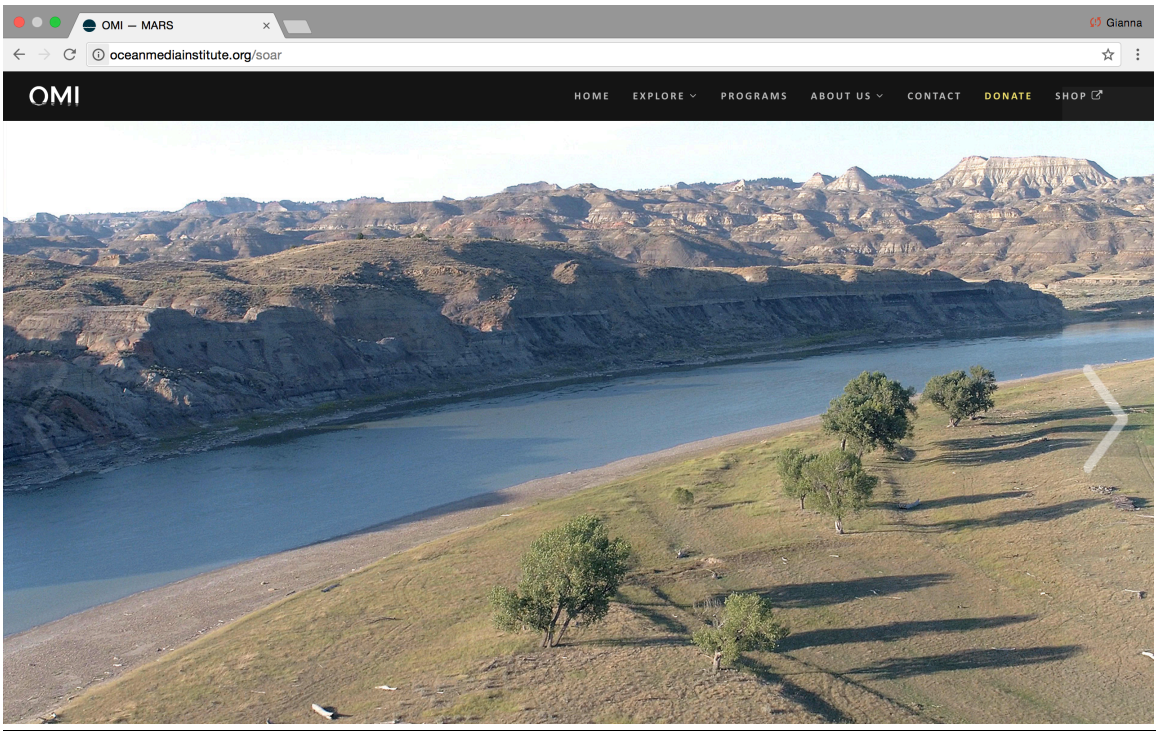

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BILLINGS
Flowing northeast across the Northern Great Plains toward Billings, the Yellowstone River shape-shifts yet again. The Lower Yellowstone is where the river grows BIG and DEEP, even in late summer when the flows taper off. Other than the occasional brown trout, you won't find many trout on the lower river, as the water is too turbid for sight-feeding predators to find prey. In their place, scores of large catfish, pike, walleye, and smallmouth bass inhabit these warm waters, as does the critically endangered pallid sturgeon. Weighing in at 70 pounds, this prehistoric goliath is arguably the rarest fish to swim the Yellowstone.

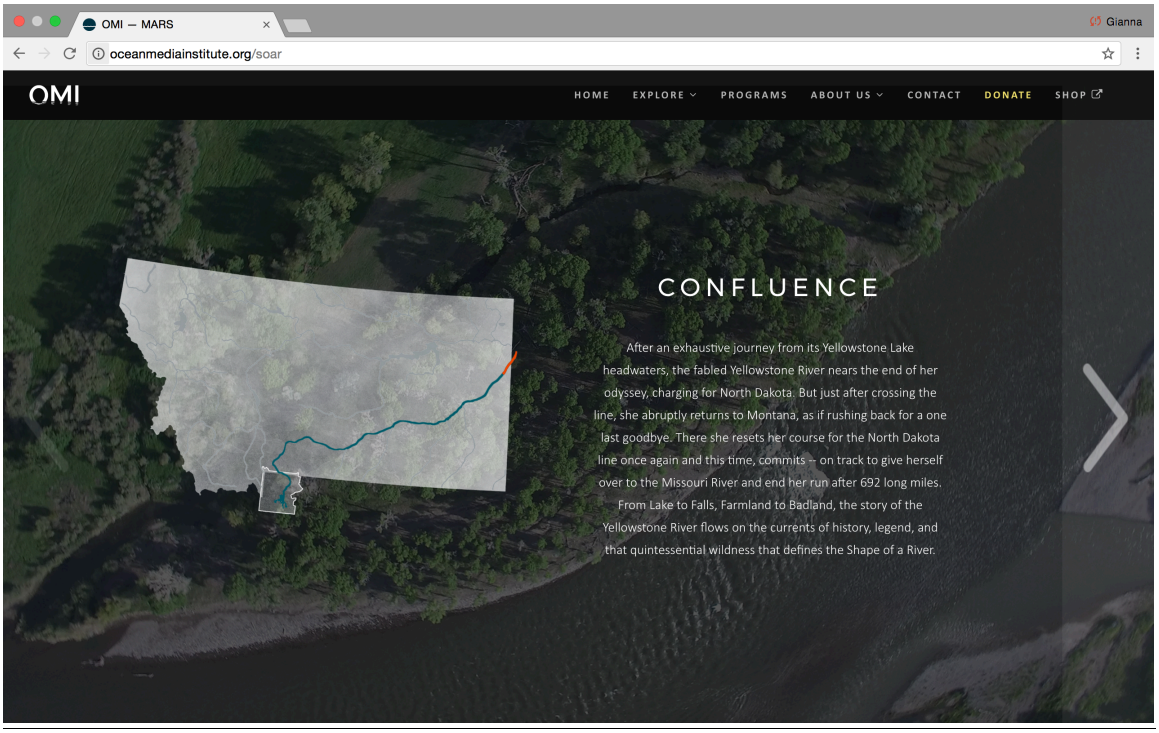

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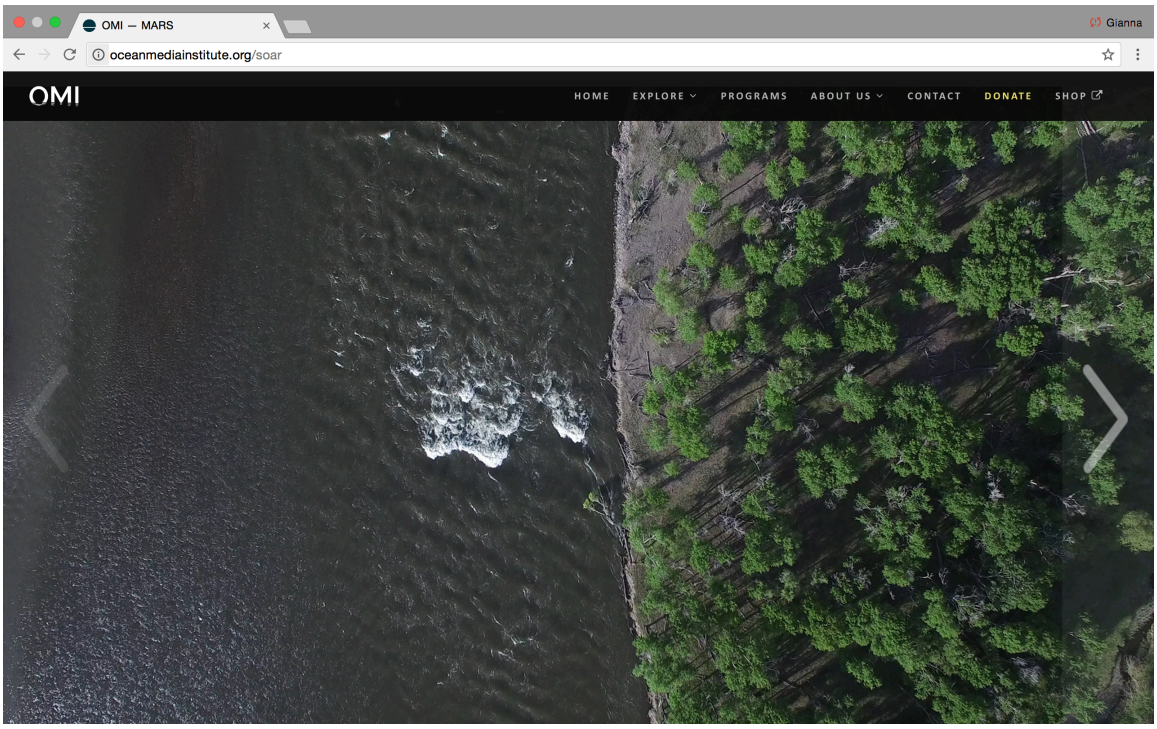

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LOWER YELLOWSTONE
Here, the Yellowstone River becomes a working river. The valley is laced with irrigation projects that pull water from the river for sugar beets, grains, hay, and cattle. As development increases, so do the pressures on the river. Many irrigation systems use natural tributary streams as waste channels to return excess water back to the river when irrigation demands are lower. This can cause serious impacts in terms of the natural flow of these streams, erosion, and fish distribution. Thankfully, stakeholders from diverse camps are finding ways to come together to work with the river and assure its endurance as the lifeblood of Montana.

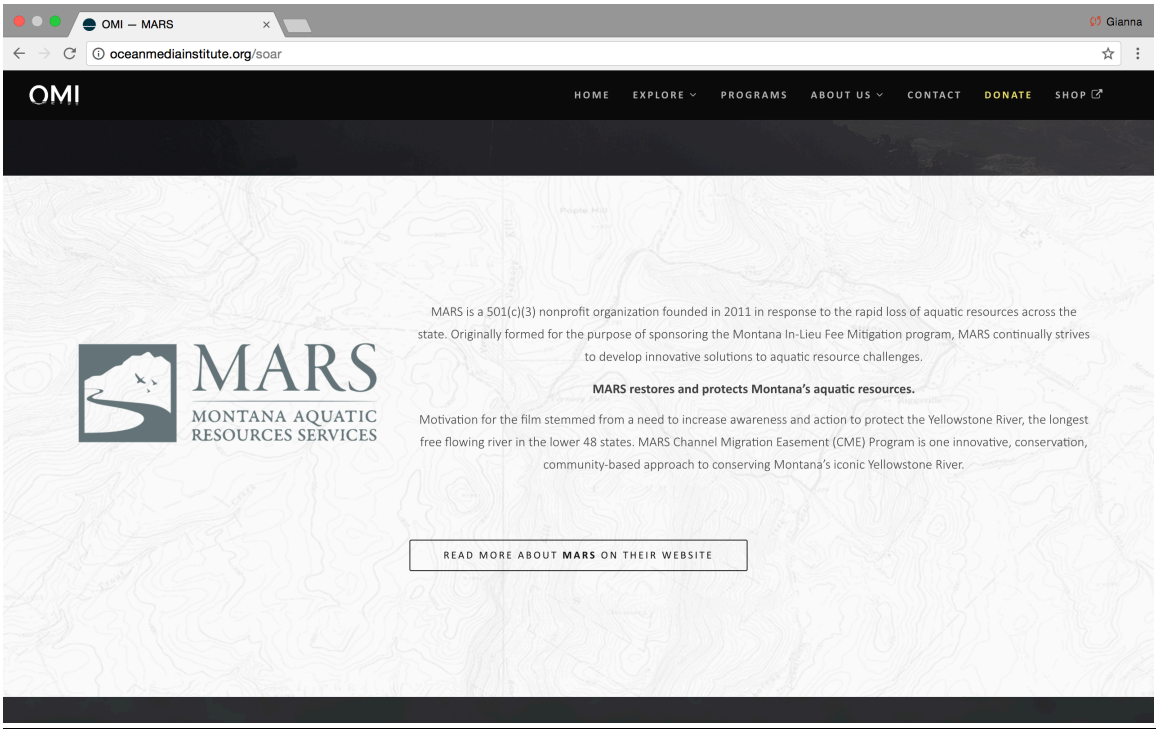

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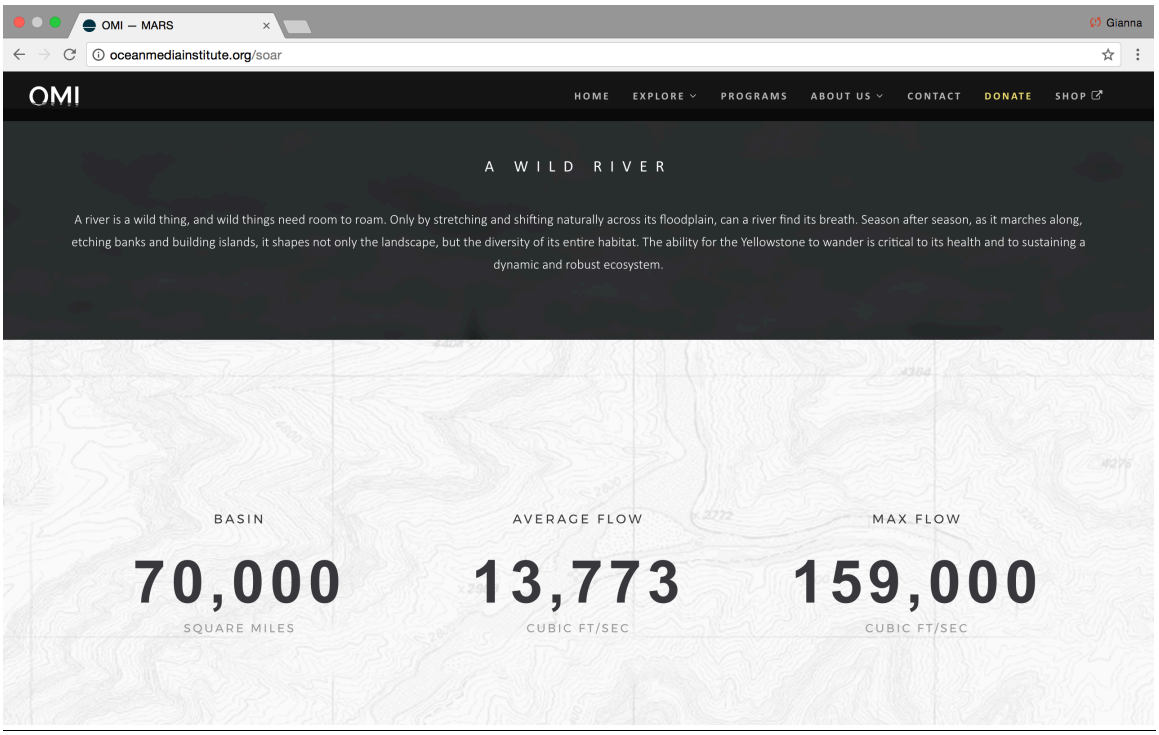

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BADLANDS
Long before Lewis and Clark made their epic journey, French fur trappers working the Yellowstone River in Eastern Montana encountered an impossible landscape they called, “Mauvais terres” -- "Badlands." Here, the Yellowstone River scripts its signature across the bed of a long ago ocean as it slices through the labyrinth of rock cathedrals and pyramids that spike some 3,000 feet high. In this place, it's easy to imagine life as it was 65 million years ago as the bones of the earth reveal themselves in rolling hills and spires of mudstone and sandstone deposited during the last part of the Cretaceous Period -- a time when Tyrannosaurus and Triceratops ruled.

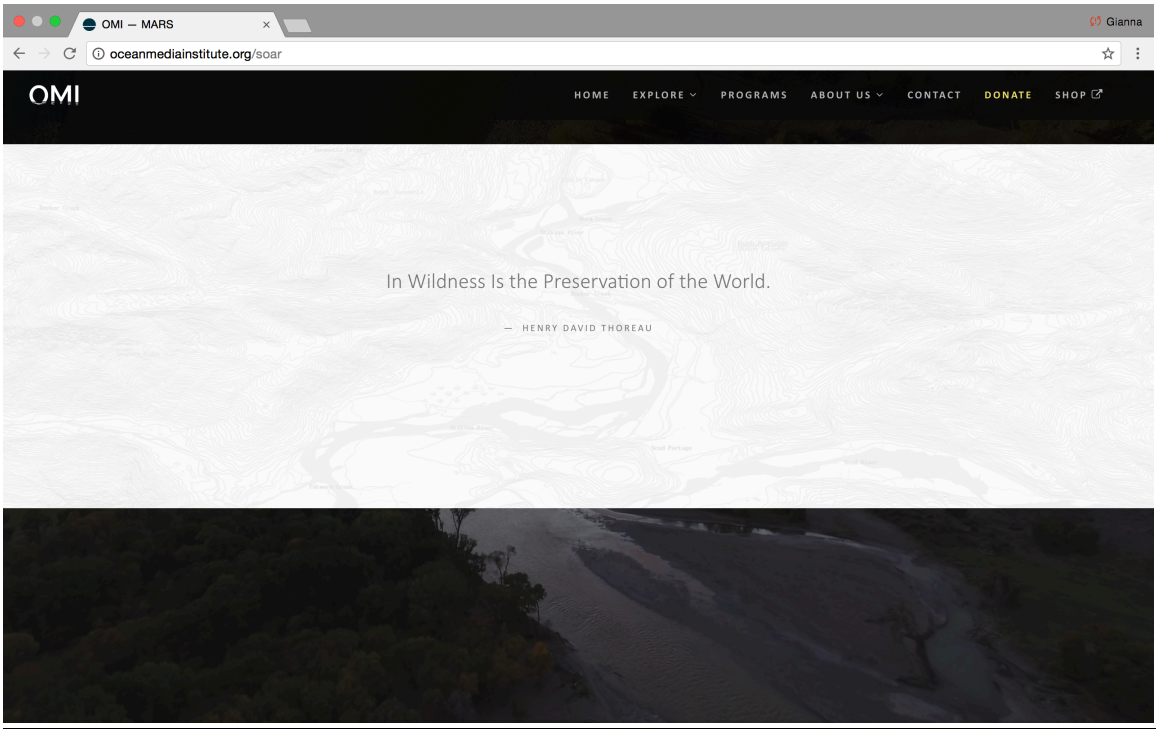

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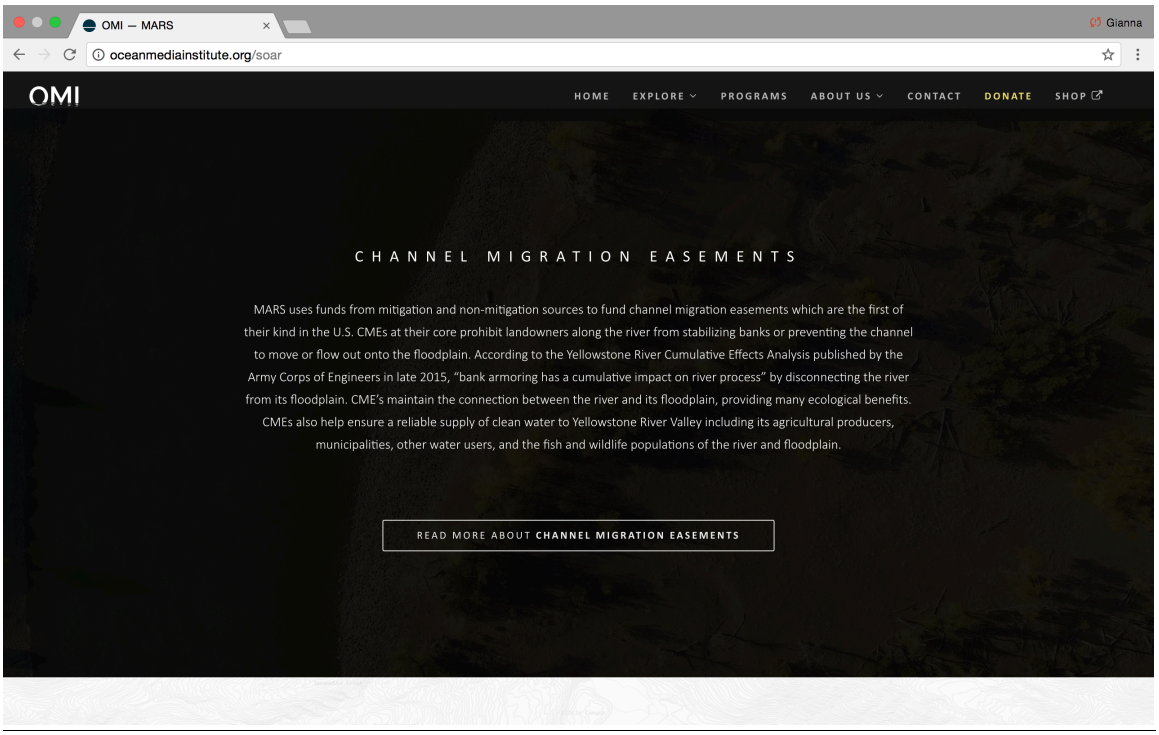

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CONFLUENCE
After an exhaustive journey from its Yellowstone Lake headwaters, the fabled Yellowstone River nears the end of her odyssey, charging for North Dakota. But just after crossing the line, she abruptly returns to Montana, as if rushing back for a one last goodbye. There she resets her course for the North Dakota line once again and this time, commits -- on track to give herself over to the Missouri River and end her run after 692 long miles. From Lake to Falls, Farmland to Badland, the story of the Yellowstone River flows on the currents of history, legend, and that quintessential wildness that defines the Shape of a River.

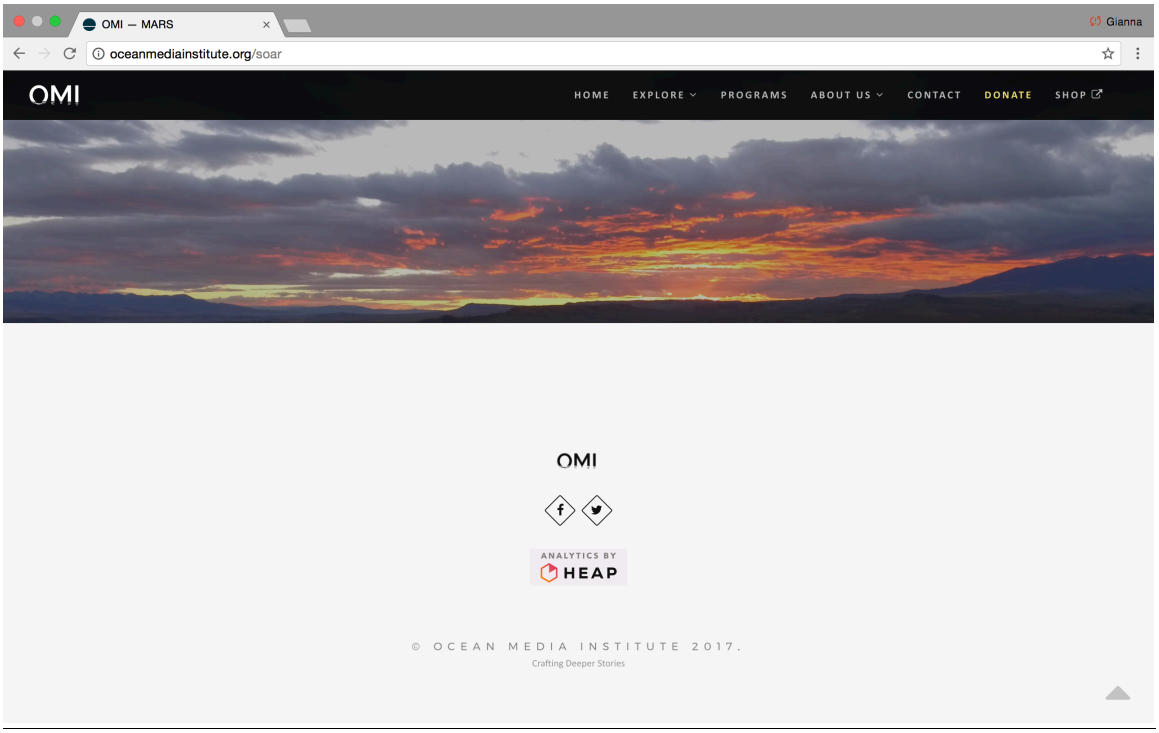

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MONTANA AQUATIC RESOURCES SERVICES
MARS is a 501(c)(3) nonprofit organization founded in 2011 in response to the rapid loss of aquatic resources across the state. Originally formed for the purpose of sponsoring the Montana In-Lieu Fee Mitigation program, MARS continually strives to develop innovative solutions to aquatic resource challenges.
MARS restores and protects Montana's aquatic resources.
Motivation for the film stemmed from a need to increase awareness and action to protect the Yellowstone River, the longest free flowing river in the lower 48 states. MARS Channel Migration Easement (CME) Program is one innovative, conservation, community-based approach to conserving Montana's iconic Yellowstone River.
READ MORE ABOUT MARS ON THEIR WEBSITE

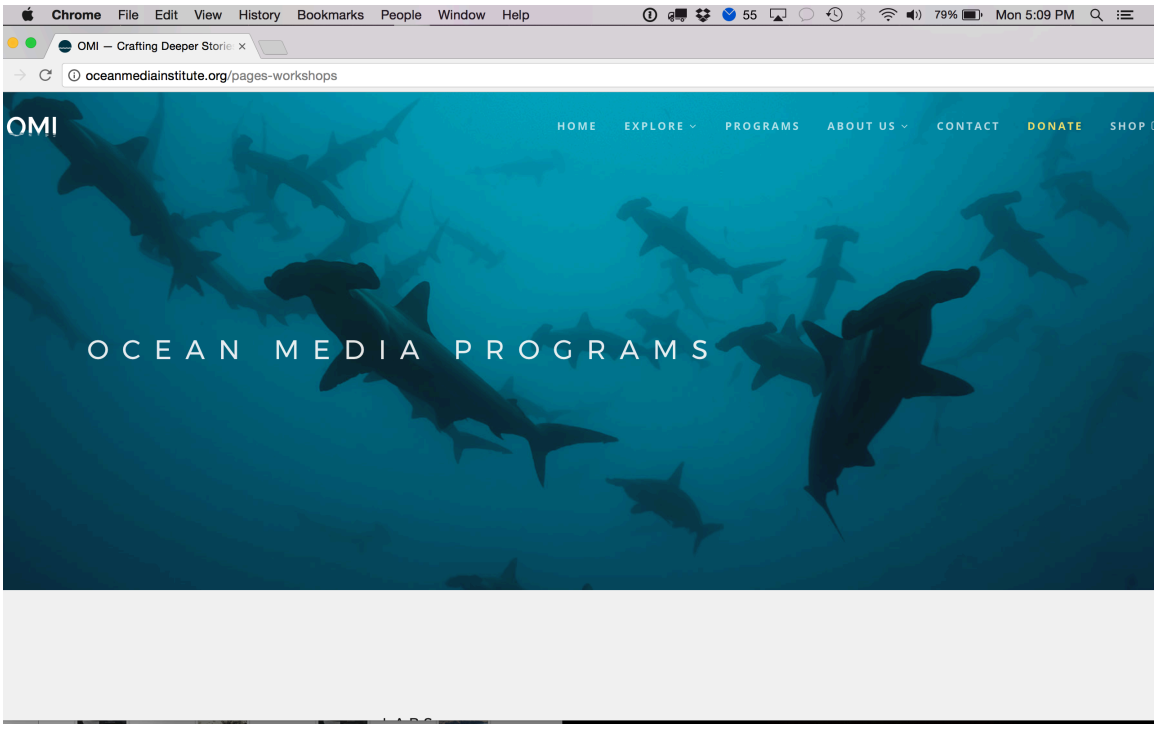

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A WILD RIVER
A river is a wild thing, and wild things need room to roam. Only by stretching and shifting naturally across its floodplain, can a river find its breath. Season after season, as it marches along, etching banks and building islands, it shapes not only the landscape, but the diversity of its entire habitat. The ability for the Yellowstone to wander is critical to its health and to sustaining a dynamic and robust ecosystem.
BASIN
70,000
SQUARE MILES
AVERAGE FLOW
13,773
CUBIC FT/SEC
MAX FLOW
159,000
CUBIC FT/SEC

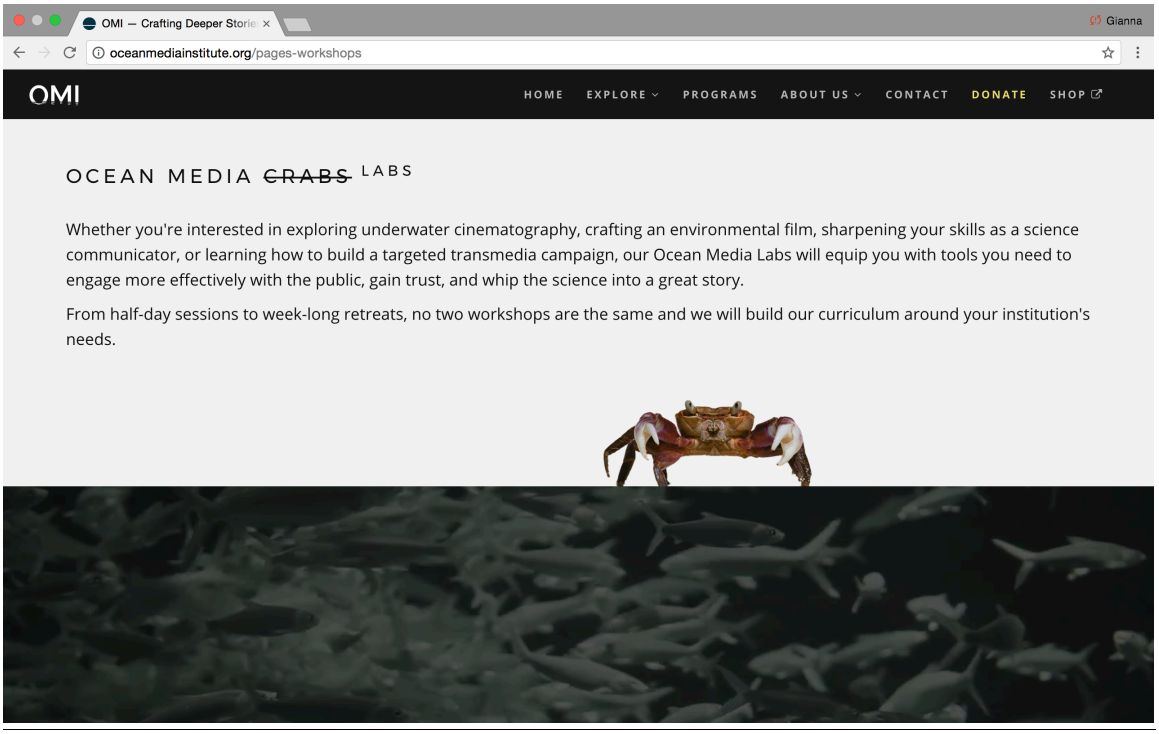

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In Wildness Is the Preservation of the World.
— HENRY DAVID THOREAU

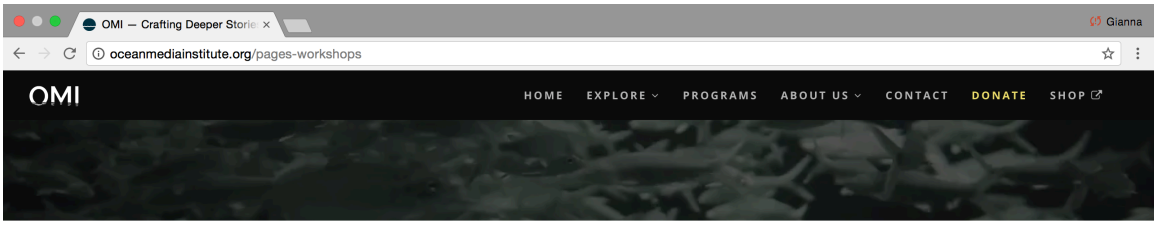

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CHANNEL MIGRATION EASEMENTS
MARS uses funds from mitigation and non-mitigation sources to fund channel migration easements which are the first of their kind in the U.S. CMEs at their core prohibit landowners along the river from stabilizing banks or preventing the channel to move or flow out onto the floodplain. According to the Yellowstone River Cumulative Effects Analysis published by the Army Corps of Engineers in late 2015, "bank armoring has a cumulative impact on river process" by disconnecting the river from its floodplain. CME's maintain the connection between the river and its floodplain, providing many ecological benefits. CMEs also help ensure a reliable supply of clean water to Yellowstone River Valley including its agricultural producers, municipalities, other water users, and the fish and wildlife populations of the river and floodplain.
READ MORE ABOUT CHANNEL MIGRATION EASEMENTS


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Whether you're interested in exploring underwater cinematography, crafting an environmental film, sharpening your skills as a science communicator, or learning how to build a targeted transmedia campaign, our Ocean Media Labs will equip you with tools you need to engage more effectively with the public, gain trust, and whip the science into a great story.
From half-day sessions to week-long retreats, no two workshops are the same and we will build our curriculum around your institution's needs.

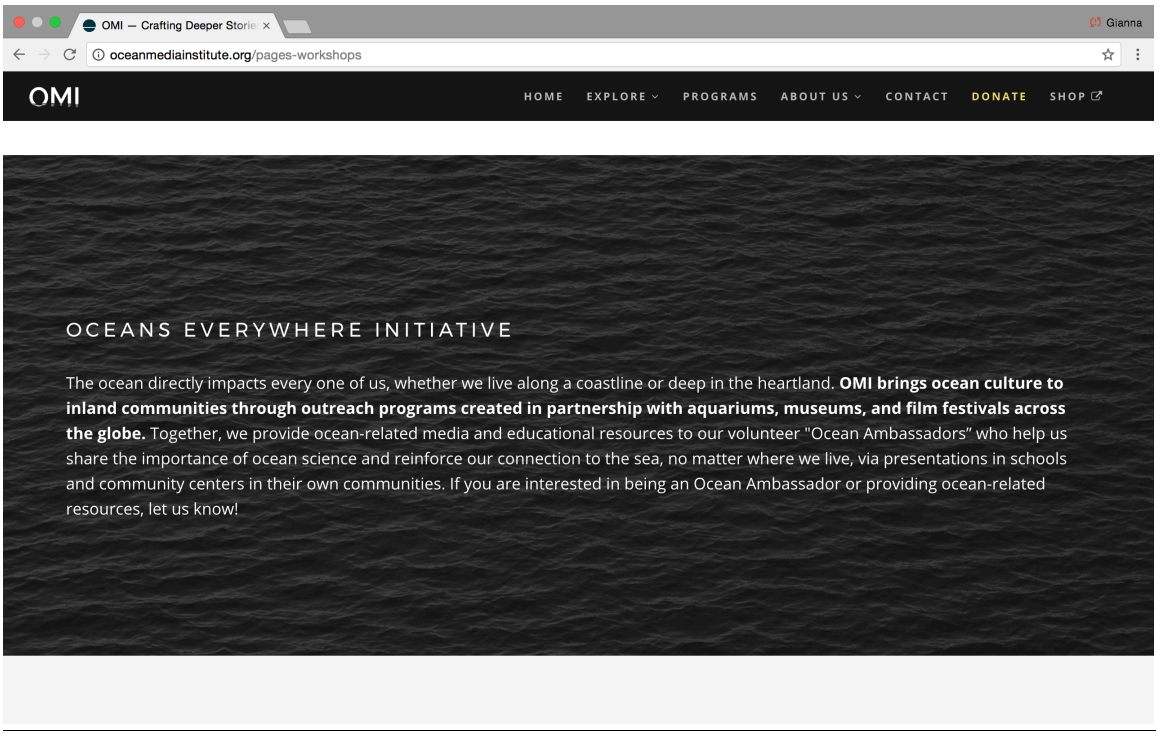


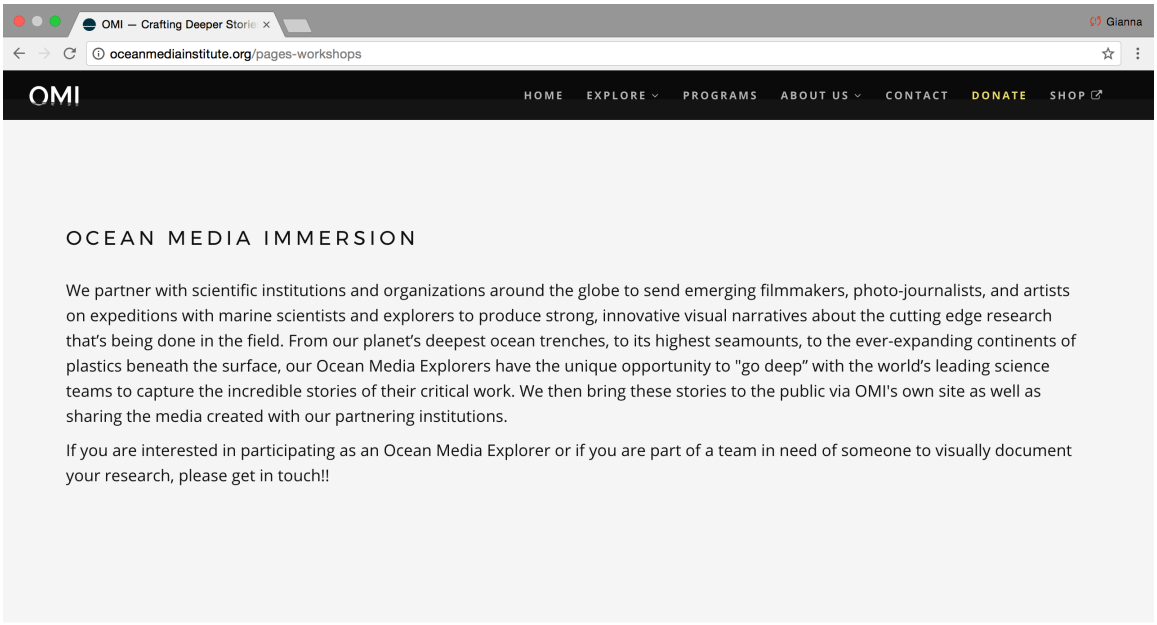
SCIENCE-TO-STORY SEMINARS

How do you spin a scientific idea into a compelling story? No matter how important your message may be, when it comes to reaching a general audience in an impactful way, the facts alone won't cut it. But good science can make for great narratives that do more than just inform -- they can inspire.

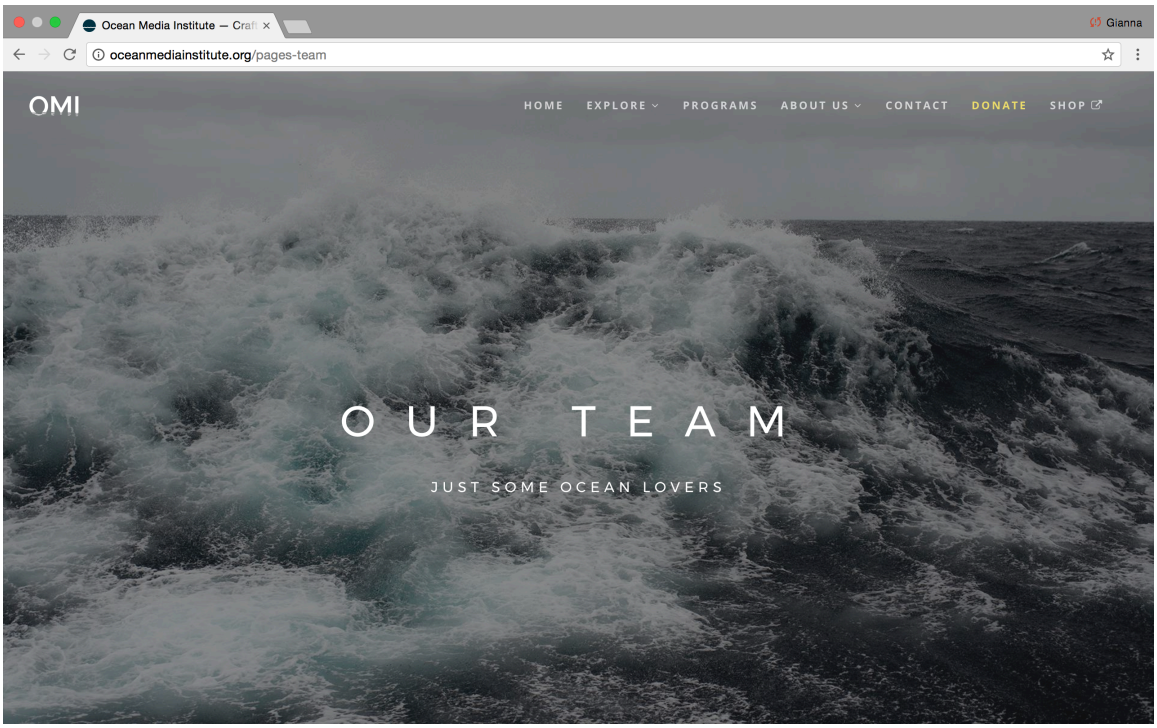
These seminars, led by award-winning filmmakers, writers, and science communicators, will equip you with the tools you need to sharpen your storytelling skills in order to imbue your subjects with action, emotion, and life.

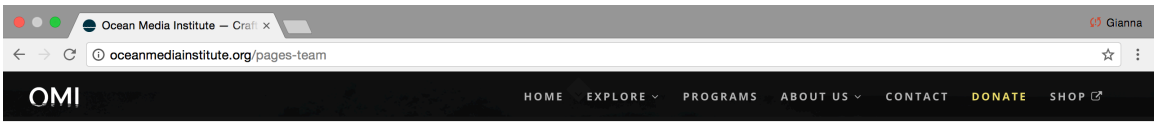
- THE ART OF SCIENCE FILMMAKING
- CRAFTING THE STORY
- IN THE HOT SEAT
- THE EDIT




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We partner with scientific institutions and organizations around the globe to send emerging filmmakers, photo-journalists, and artists on expeditions with marine scientists and explorers to produce strong, innovative visual narratives about the cutting edge research that's being done in the field. From our planet's deepest ocean trenches, to its highest seamounts, to the ever-expanding continents of plastics beneath the surface, our Ocean Media Explorers have the unique opportunity to "go deep" with the world's leading science teams to capture the incredible stories of their critical work. We then bring these stories to the public via OMI's own site as well as sharing the media created with our partnering institutions.
If you are interested in participating as an Ocean Media Explorer or if you are part of a team in need of someone to visually document your research, please get in touch!!

Our Team





GIANNA SAVOIE

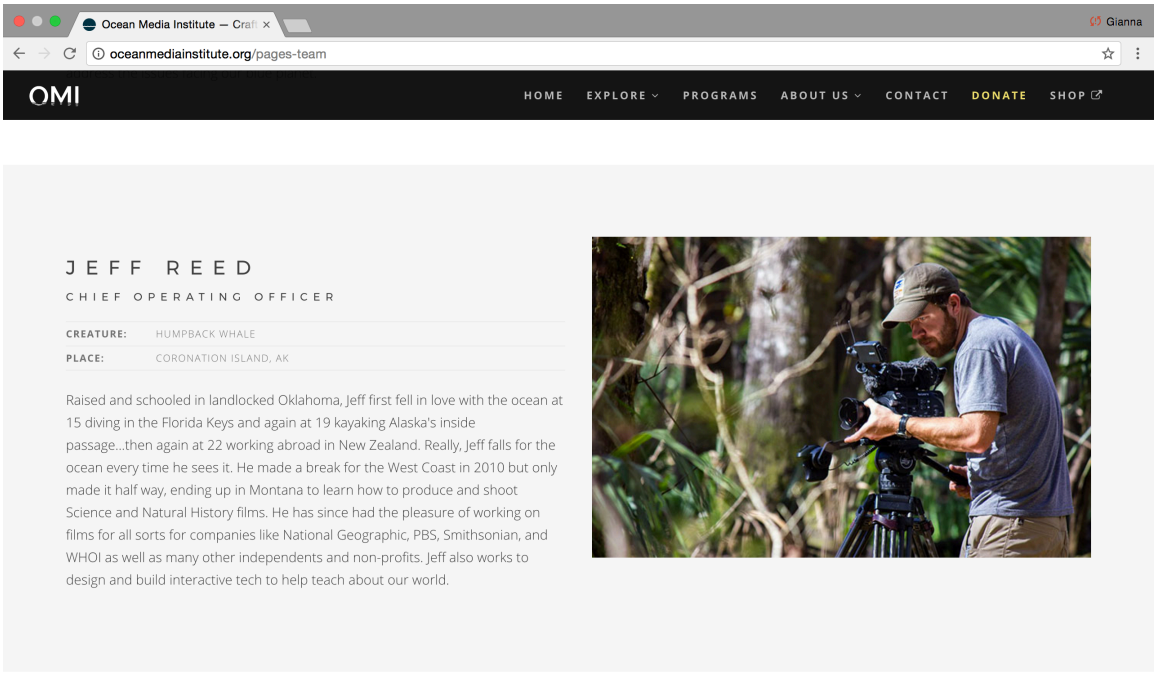
EXECUTIVE DIRECTOR

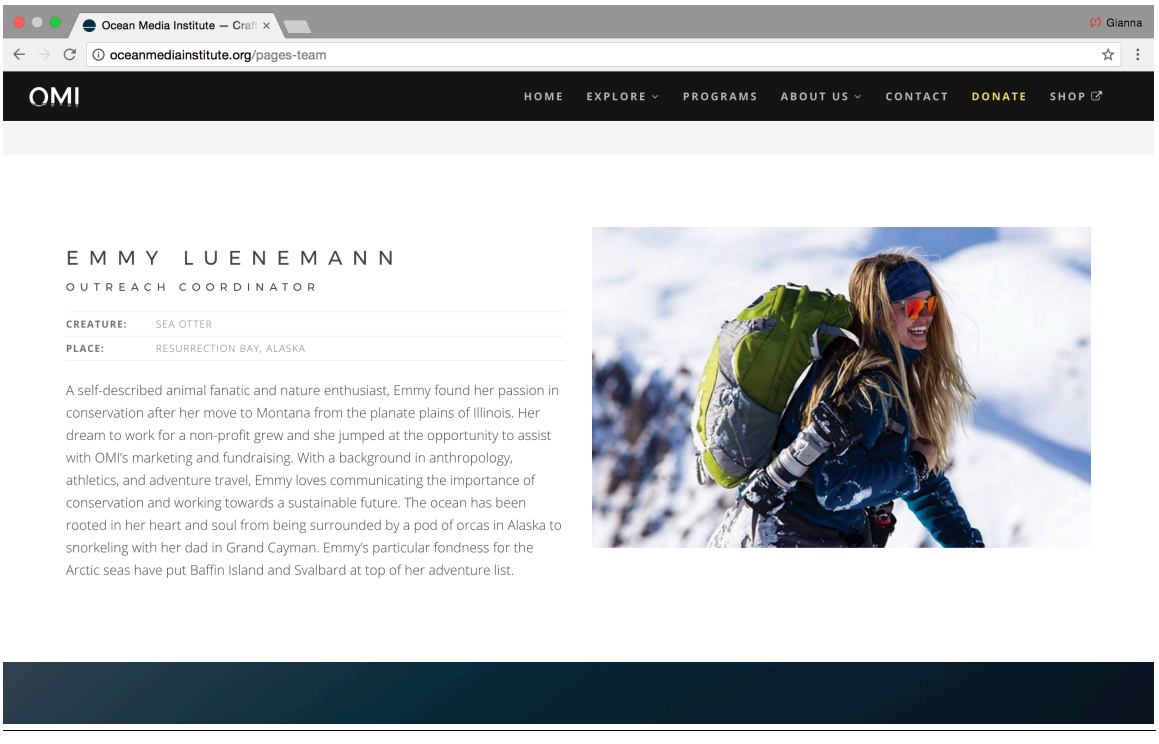
CREATURE:	WEEDY SEA DRAGON
PLACE:	SITTING ROCK, MAINE

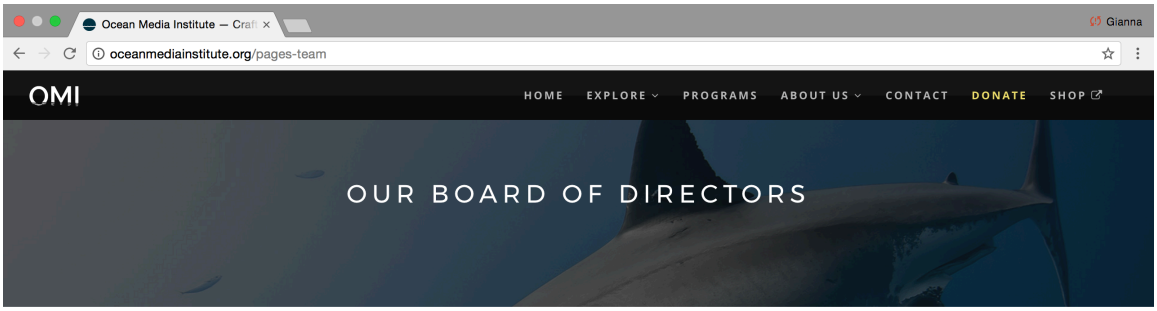
Born and bred in the "Ocean State," you could say it was something in the water that gave shape to Gianna's deep love of marine environments and to a career as an award-winning natural history filmmaker. Whether investigating the impact of plastic on leatherback sea turtles, relaying the effects of sea-level rise on a small community in Vanuatu, or chronicling the journey of a band of South Pacific Islanders on their epic voyage across the Pacific, Gianna's pursuit of powerful environmental storytelling has led her to sink her teeth into some of the most critical conservation issues on the planet. Her work has been featured on PBS, National Geographic, Discovery, and the BBC, among others.

With roots now planted in Montana, this Mountain Mermaid is hell-bent on turning the tide by embracing a collective artistic approach to ocean advocacy in order to address the issues facing our blue planet.




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JEFF REED
CHIEF OPERATING OFFICER
CREATURE: HUMPBACK WHALE
PLACE: CORONATION ISLAND, AK
Raised and schooled in landlocked Oklahoma, Jeff first fell in love with the ocean at 15 diving in the Florida Keys and again at 19 kayaking Alaska's inside passage...then again at 22 working abroad in New Zealand. Really, Jeff falls for the ocean every time he sees it. He made a break for the West Coast in 2010 but only made it half way, ending up in Montana to learn how to produce and shoot Science and Natural History films. He has since had the pleasure of working on films for all sorts for companies like National Geographic, PBS, Smithsonian, and WHOI as well as many other independents and non-profits. Jeff also works to design and build interactive tech to help teach about our world.


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EMMY LUENEMANN
OUTREACH COORDINATOR
CREATURE: SEA OTTER
PLACE: RESURRECTION BAY, ALASKA
A self-described animal fanatic and nature enthusiast, Emmy found her passion in conservation after her move to Montana from the planate plains of Illinois. Her dream to work for a non-profit grew and she jumped at the opportunity to assist with OMI's marketing and fundraising. With a background in anthropology, athletics, and adventure travel, Emmy loves communicating the importance of conservation and working towards a sustainable future. The ocean has been rooted in her heart and soul from being surrounded by a pod of orcas in Alaska to snorkeling with her dad in Grand Cayman. Emmy's particular fondness for the Arctic seas have put Baffin Island and Svalbard at top of her adventure list.



ELISE DUFOUR

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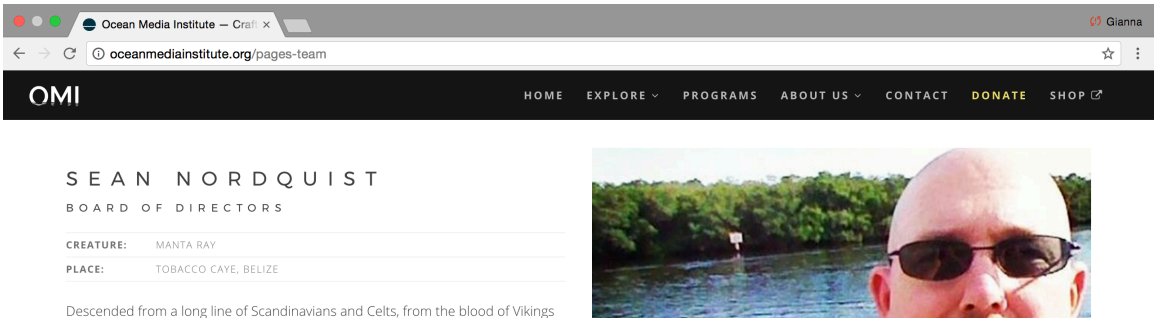
CREATURE: CUTTLEFISH

PLACE: SAN JUAN ISLANDS, WA



"Educate and Empower through Respect and you will change the World right before your very eyes!"

Growing up in a fishing family in a small town north of Seattle, Elise learned how to gut fish before she could even tie her own shoes. Life was lived outside climbing trees, catching tadpoles, building forts, exploring the San Juan Islands, working on fishing boats and treasure hunting on the shores of Puget Sound. The ocean has always played a vital role in Elise's life. Her love for the ocean has grown exponentially over the years.



SEAN NORDQUIST

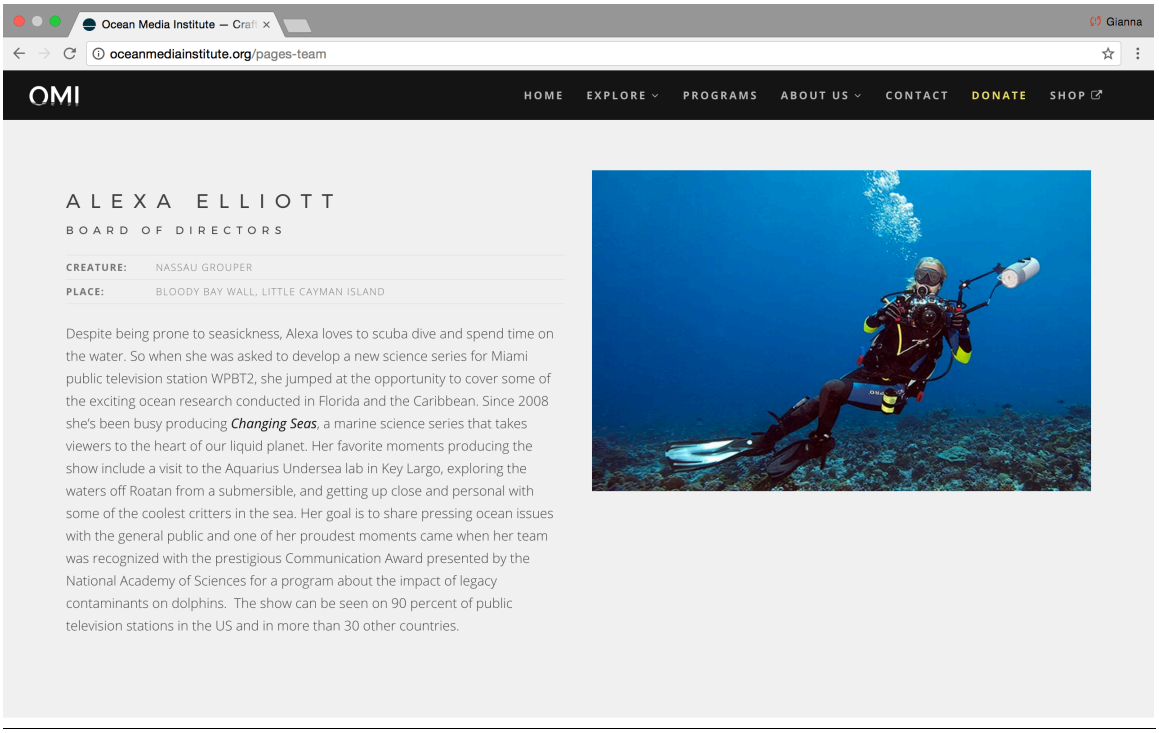
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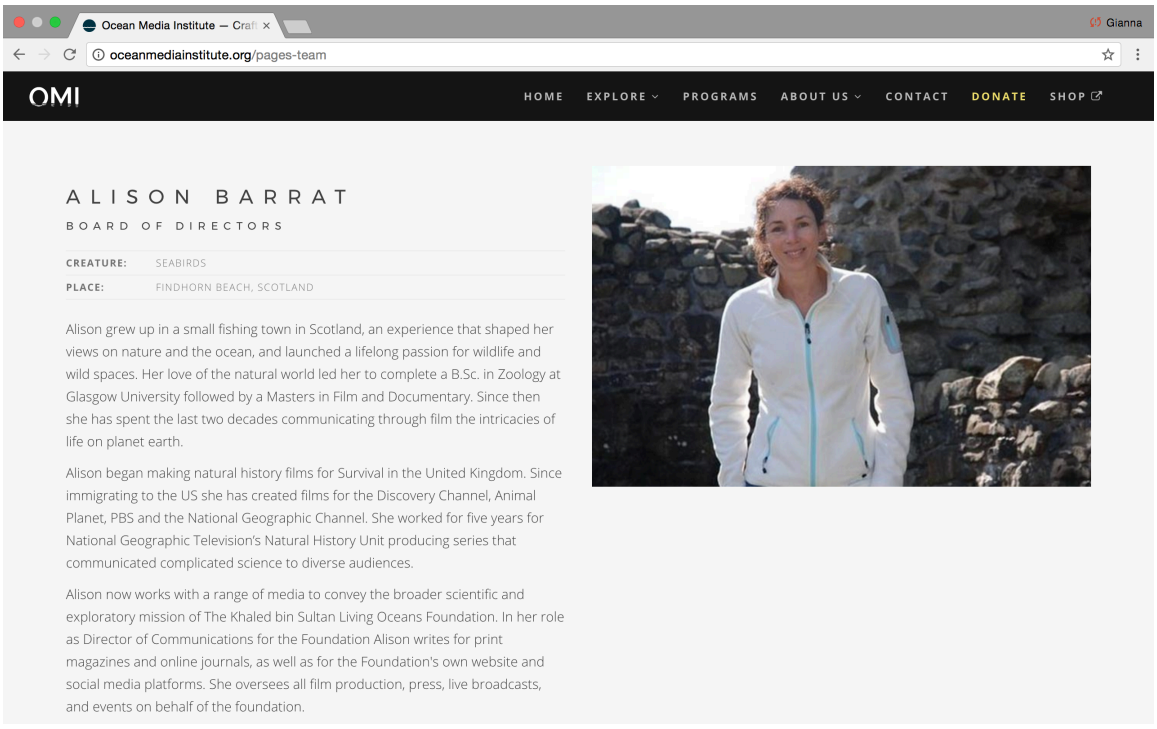
CREATURE: MANTA RAY

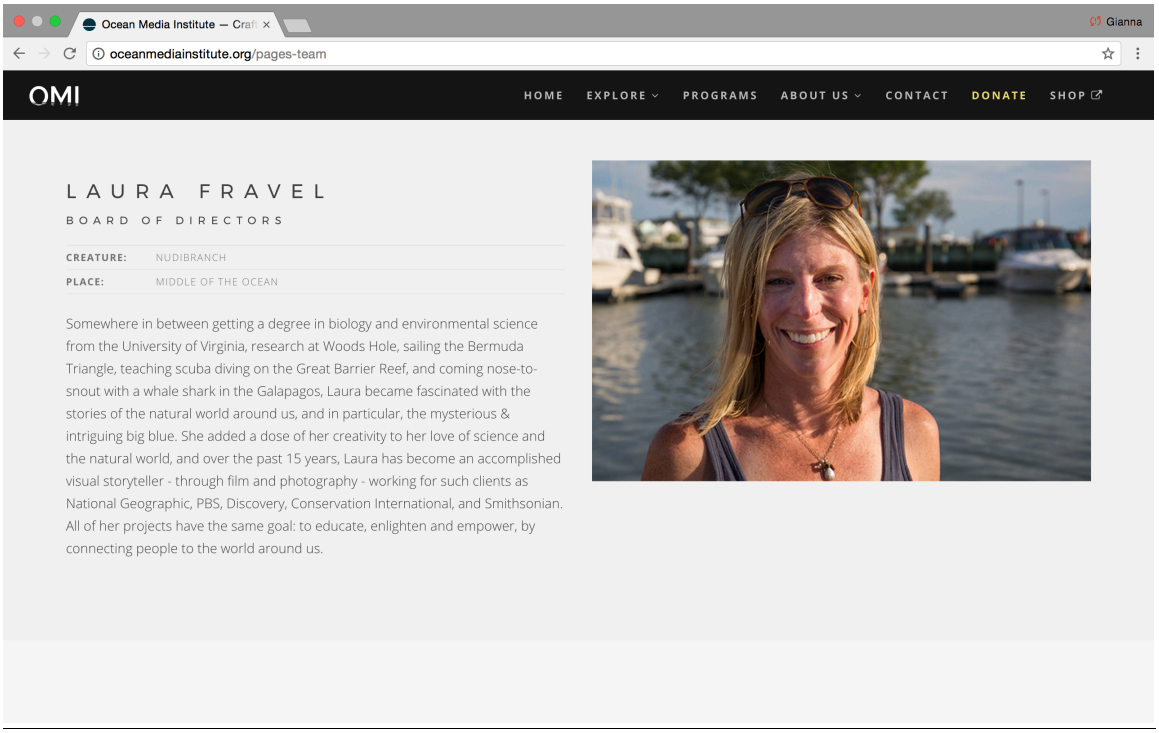
PLACE: TOBACCO CAYE, BELIZE

Descended from a long line of Scandinavians and Celts, from the blood of Vikings and pirates, it was no surprise that Sean followed a life of the sea, exploration, and discovery. He is an educator by vocation, and a writer and storyteller by nature. As the son of teachers on the sunny shores of Southern California, Sean was taught from a young age the importance of the natural world and imbued with a desire to protect it. He has studied the environment and conservation alongside literature and writing, inspired by the works of Rachel Carson, Edward Abbey, Henry David Thoreau, and Hildegard von Bingen. Sean uses the power of story to convey the importance of stewardship, environmental and ocean literacy, and a sense of urgency towards marine protection and understanding. Getting people out under the open sky - and in and on the water - has the power to spark engagement and a connection that only first hand experience can inspire.

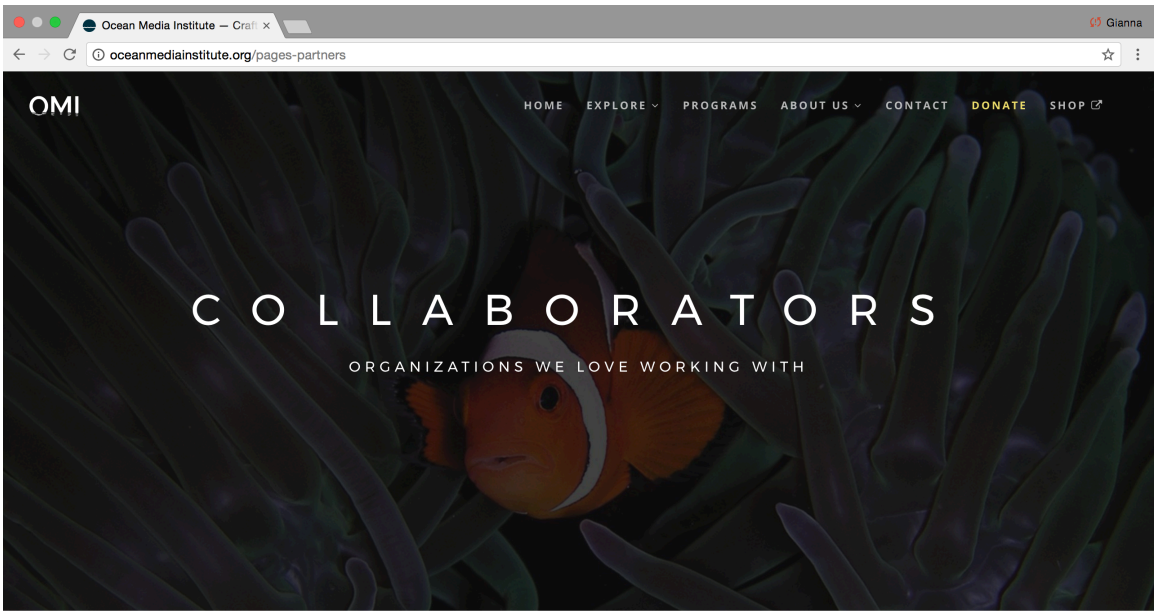
Now twenty years in Florida, the Pirate Viking is looking to that horizon again, relentless in his voyage to bring a love of the Big Blue to as many eyes and ears as he can by integrating science, education, and experience.

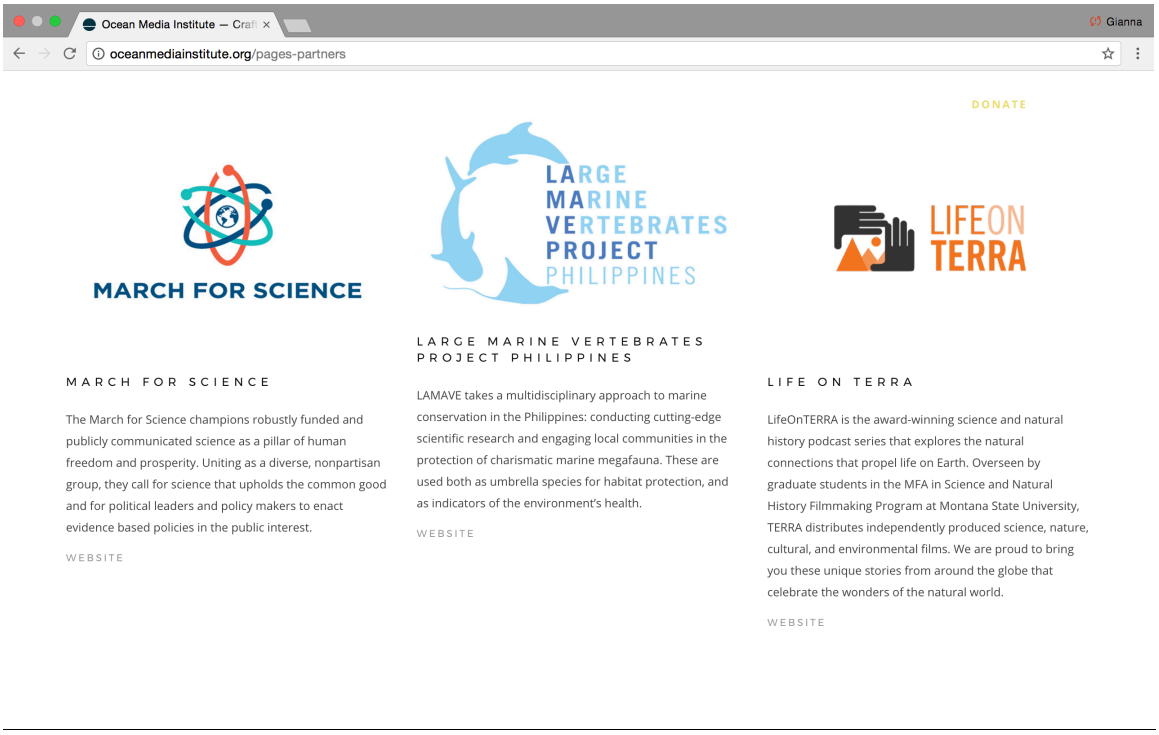

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ALEXA ELLIOTT
BOARD OF DIRECTORS
CREATURE: NASSAU GROUPER
PLACE: BLOODY BAY WALL, LITTLE CAYMAN ISLAND
Despite being prone to seasickness, Alexa loves to scuba dive and spend time on the water. So when she was asked to develop a new science series for Miami public television station WPBT2, she jumped at the opportunity to cover some of the exciting ocean research conducted in Florida and the Caribbean. Since 2008 she's been busy producing Changing Seas, a marine science series that takes viewers to the heart of our liquid planet. Her favorite moments producing the show include a visit to the Aquarius Undersea lab in Key Largo, exploring the waters off Roatan from a submersible, and getting up close and personal with some of the coolest critters in the sea. Her goal is to share pressing ocean issues with the general public and one of her proudest moments came when her team was recognized with the prestigious Communication Award presented by the National Academy of Sciences for a program about the impact of legacy contaminants on dolphins. The show can be seen on 90 percent of public television stations in the US and in more than 30 other countries.

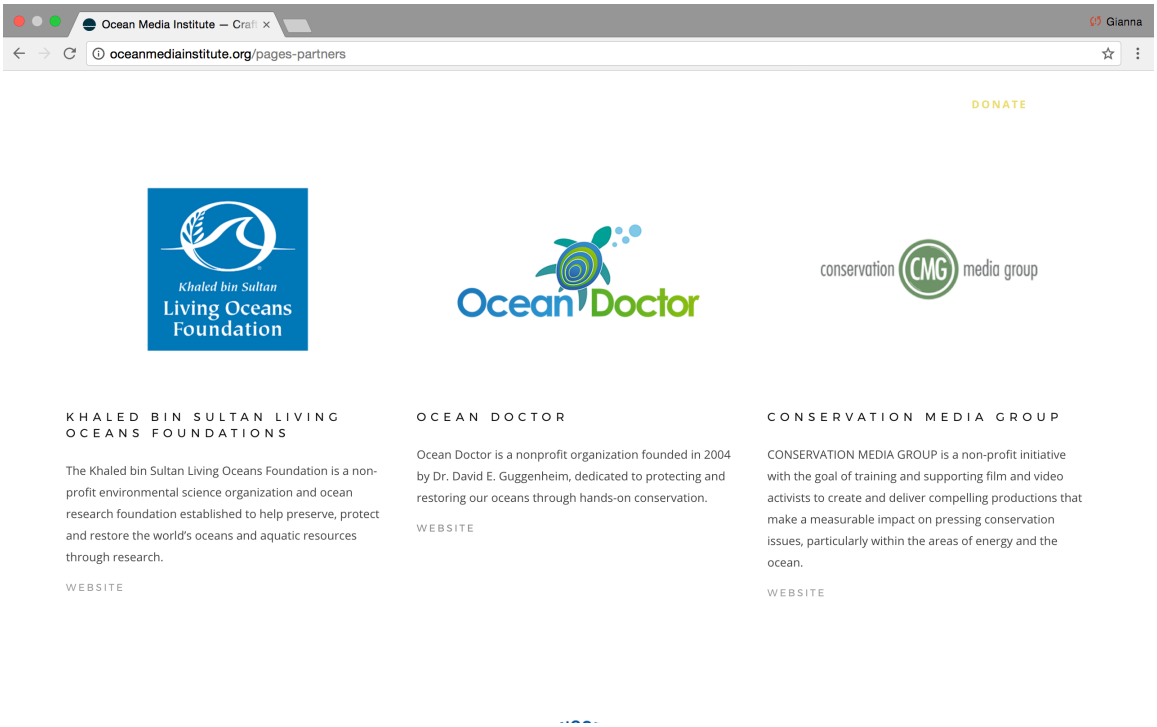

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ALISON BARRAT
BOARD OF DIRECTORS
CREATURE: SEABIRDS
PLACE: FINDHORN BEACH, SCOTLAND
Alison grew up in a small fishing town in Scotland, an experience that shaped her views on nature and the ocean, and launched a lifelong passion for wildlife and wild spaces. Her love of the natural world led her to complete a B.Sc. in Zoology at Glasgow University followed by a Masters in Film and Documentary. Since then she has spent the last two decades communicating through film the intricacies of life on planet earth.
Alison began making natural history films for Survival in the United Kingdom. Since immigrating to the US she has created films for the Discovery Channel, Animal Planet, PBS and the National Geographic Channel. She worked for five years for National Geographic Television's Natural History Unit producing series that communicated complicated science to diverse audiences.
Alison now works with a range of media to convey the broader scientific and exploratory mission of The Khaled bin Sultan Living Oceans Foundation. In her role as Director of Communications for the Foundation Alison writes for print magazines and online journals, as well as for the Foundation's own website and social media platforms. She oversees all film production, press, live broadcasts, and events on behalf of the foundation.

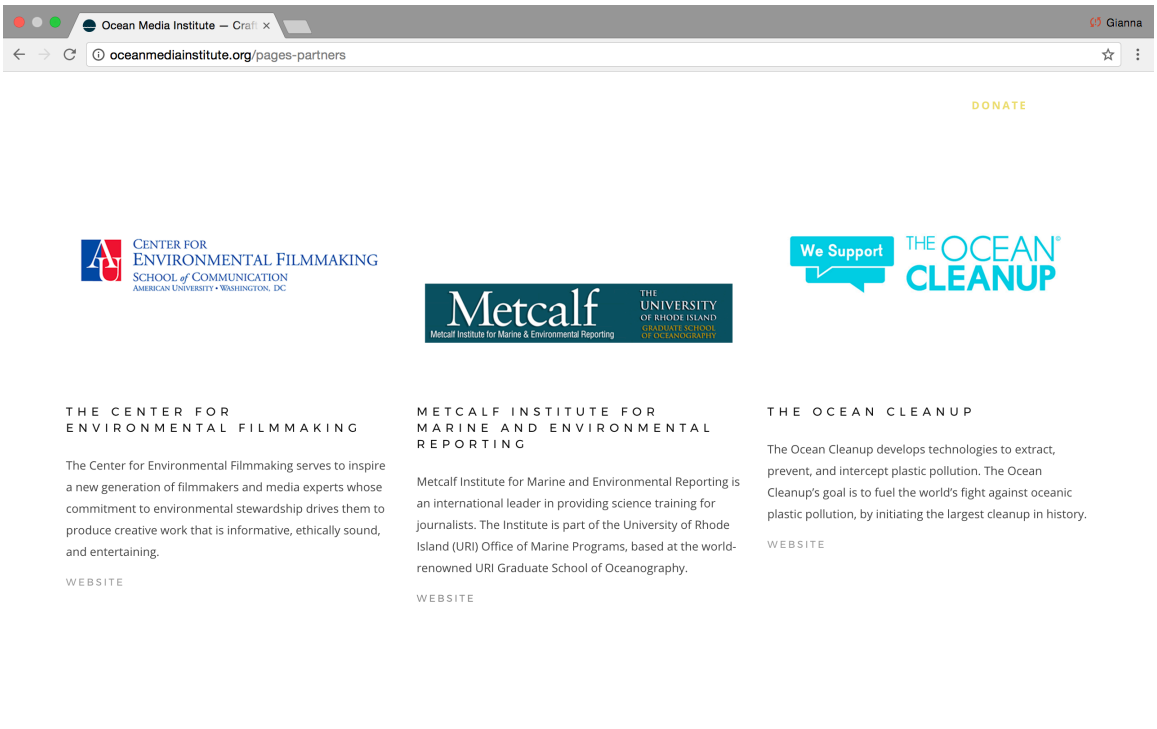

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LAURA FRAVEL
BOARD OF DIRECTORS
CREATURE: NUDIBRANCH
PLACE: MIDDLE OF THE OCEAN
Somewhere in between getting a degree in biology and environmental science from the University of Virginia, research at Woods Hole, sailing the Bermuda Triangle, teaching scuba diving on the Great Barrier Reef, and coming nose-to-snout with a whale shark in the Galapagos, Laura became fascinated with the stories of the natural world around us, and in particular, the mysterious & intriguing big blue. She added a dose of her creativity to her love of science and the natural world, and over the past 15 years, Laura has become an accomplished visual storyteller - through film and photography - working for such clients as National Geographic, PBS, Discovery, Conservation International, and Smithsonian. All of her projects have the same goal: to educate, enlighten and empower, by connecting people to the world around us.

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The Khaled bin Sultan Living Oceans Foundation is a non-profit environmental science organization and ocean research foundation established to help preserve, protect and restore the world's oceans and aquatic resources through research.
WEBSITE
OCEAN DOCTOR
Ocean Doctor is a nonprofit organization founded in 2004 by Dr. David E. Guggenheim, dedicated to protecting and restoring our oceans through hands-on conservation.
WEBSITE
CONSERVATION MEDIA GROUP
CONSERVATION MEDIA GROUP is a non-profit initiative with the goal of training and supporting film and video activists to create and deliver compelling productions that make a measurable impact on pressing conservation issues, particularly within the areas of energy and the ocean.
WEBSITE


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METCALF INSTITUTE FOR MARINE AND ENVIRONMENTAL REPORTING
Metcalf Institute for Marine and Environmental Reporting is an international leader in providing science training for journalists. The Institute is part of the University of Rhode Island (URI) Office of Marine Programs, based at the world-renowned URI Graduate School of Oceanography.
WEBSITE
THE OCEAN CLEANUP
The Ocean Cleanup develops technologies to extract, prevent, and intercept plastic pollution. The Ocean Cleanup's goal is to fuel the world's fight against oceanic plastic pollution, by initiating the largest cleanup in history.
WEBSITE



PANGAEA EXPEDITIONS

Pangaea believes that the depth, complexity and sheer inertia of the threats to our oceans is significant. Practical solutions and the resources to implement them do still exist. The central challenge is our collective will to act, to care. Pangaea also believes that our ultimate success depends on a future generation of inspired conservationists.

WEBSITE

WOODS HOLE OCEANOGRAPHIC INSTITUTION

The Woods Hole Oceanographic Institution is dedicated to research and education to advance understanding of the ocean and its interaction with the Earth system, and to communicating this understanding for the benefit of society.

WEBSITE

MORE THAN SCIENTISTS

From physicists to physicians, marine biologists to atmospheric chemists, ice to fire ecologists, More Than Scientists represents the more than 97% of concerned scientists seeking to help get the word out about climate change by telling the story of their science in personal ways.

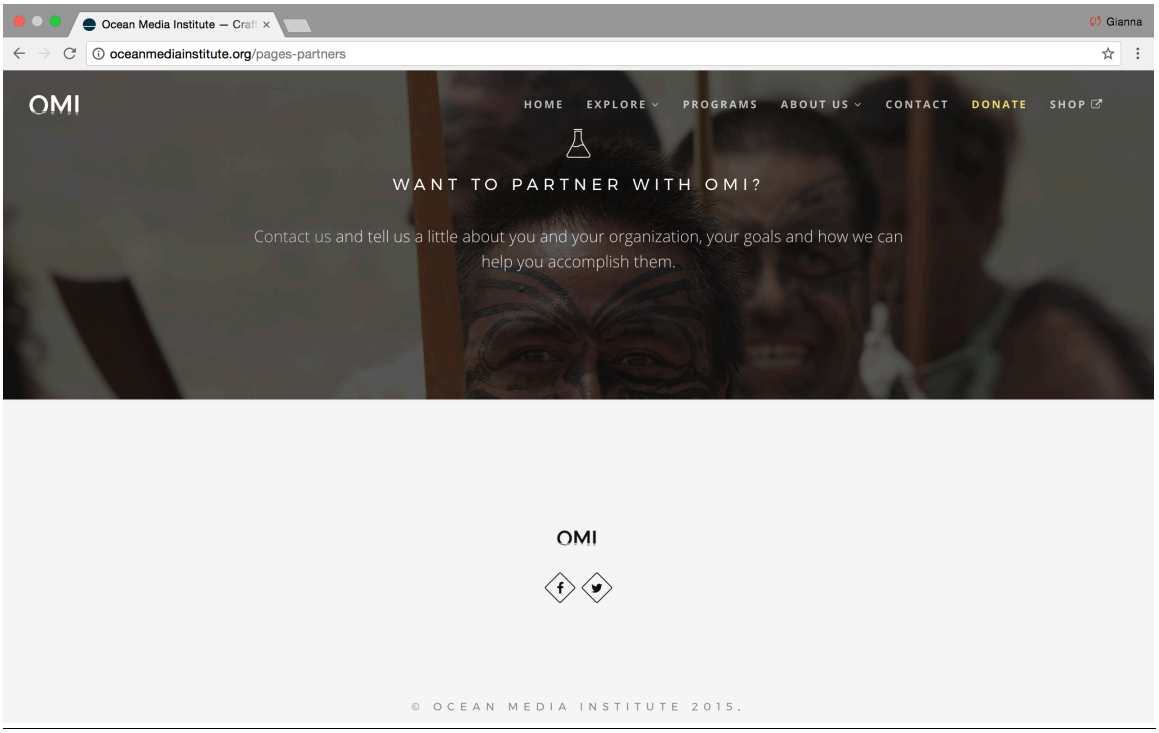
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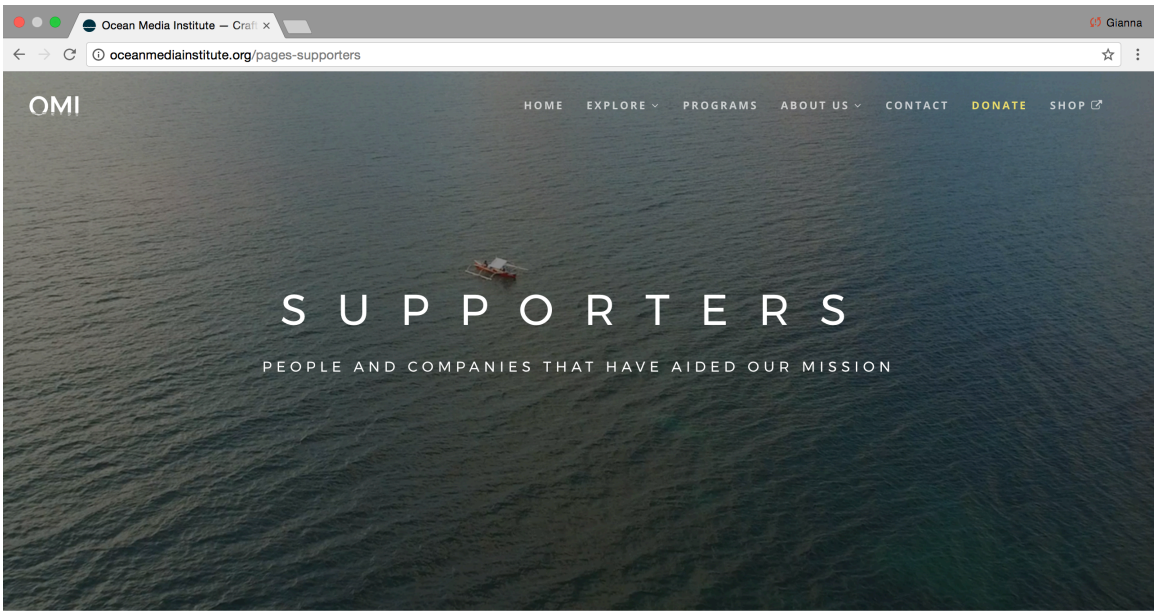
MISSION BLUE

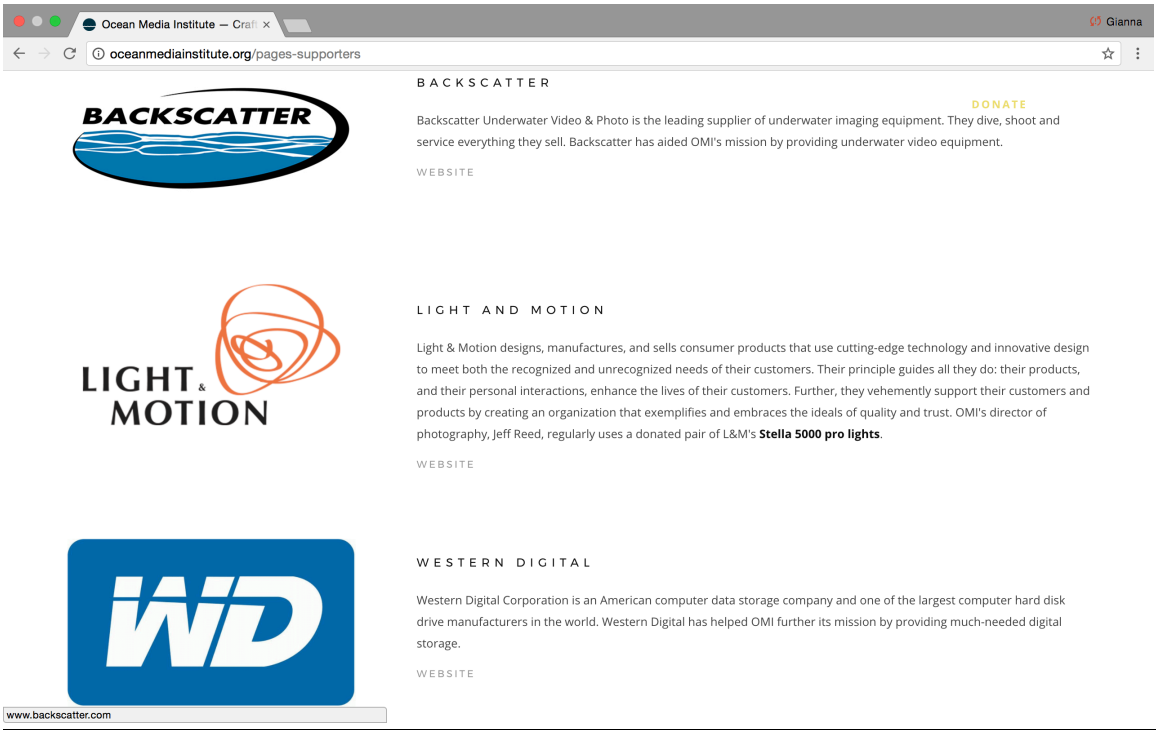
Mission Blue is a global initiative of the Sylvia Earle Alliance, a 501c3 organization, which was formed in response to Sylvia Earle's 2009 TED Prize wish. Dr. Earle urged people "to use all means at your disposal — films, expeditions, the web, new submarines — to create a campaign to ignite public support for a global network of marine protected areas; Hope Spots large enough to save and restore the blue heart of the planet."

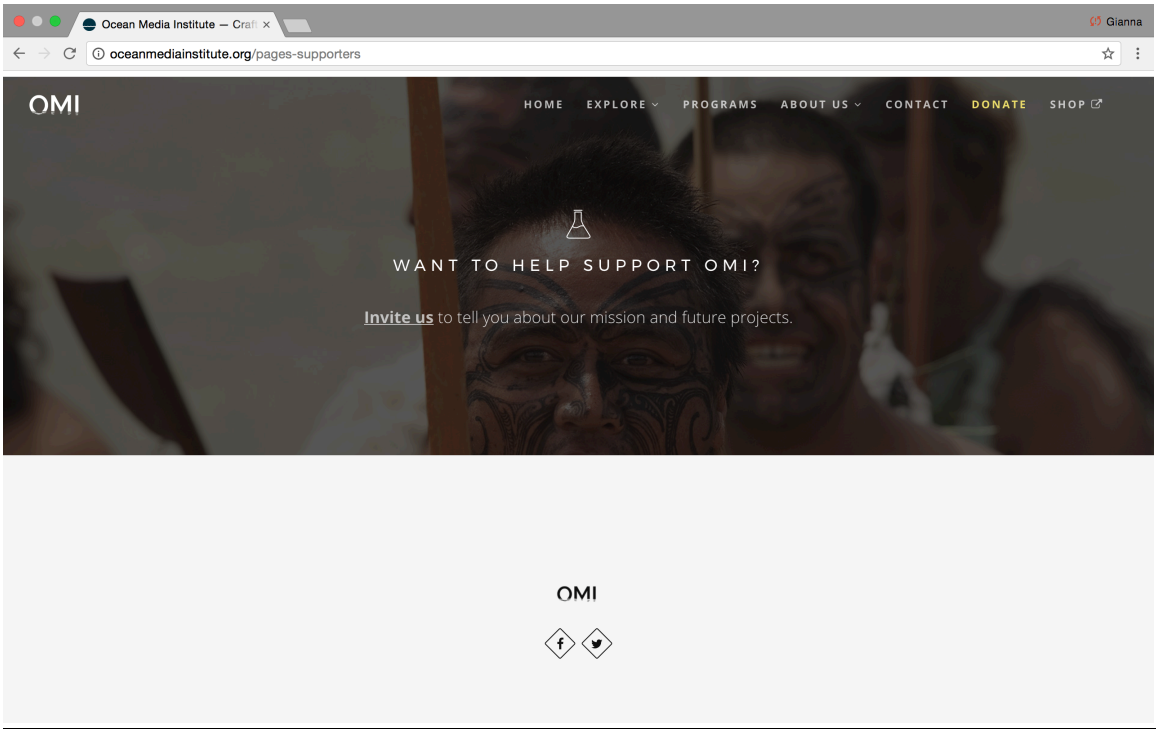
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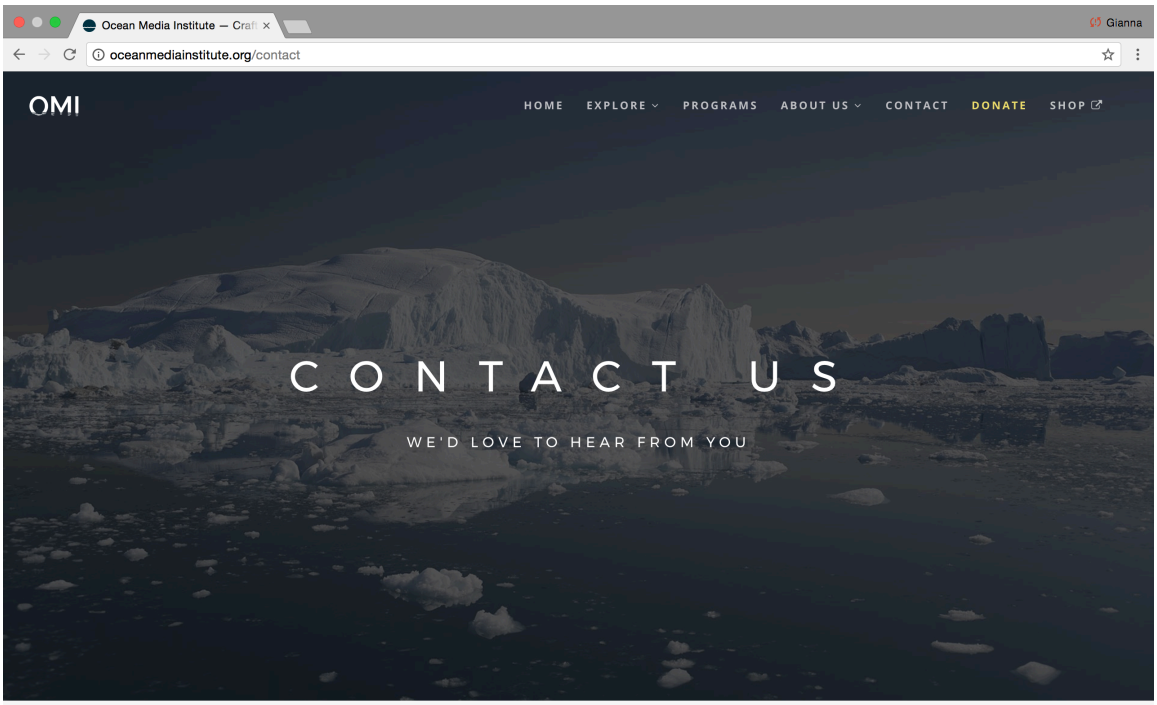
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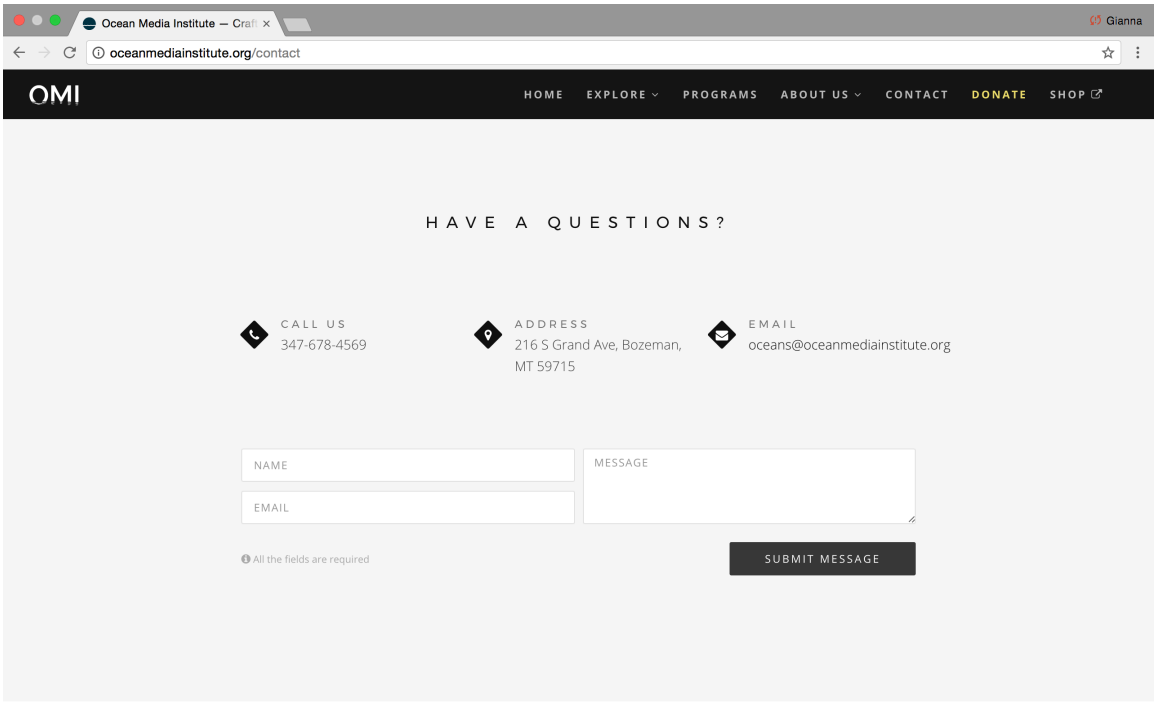


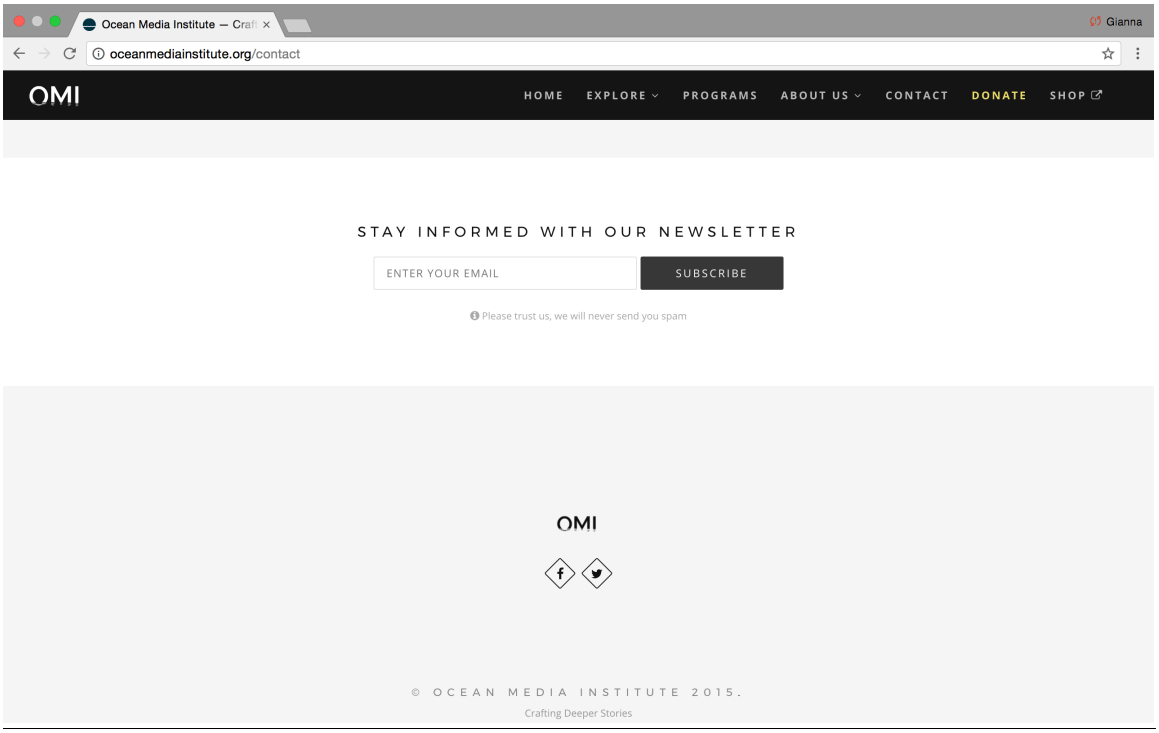



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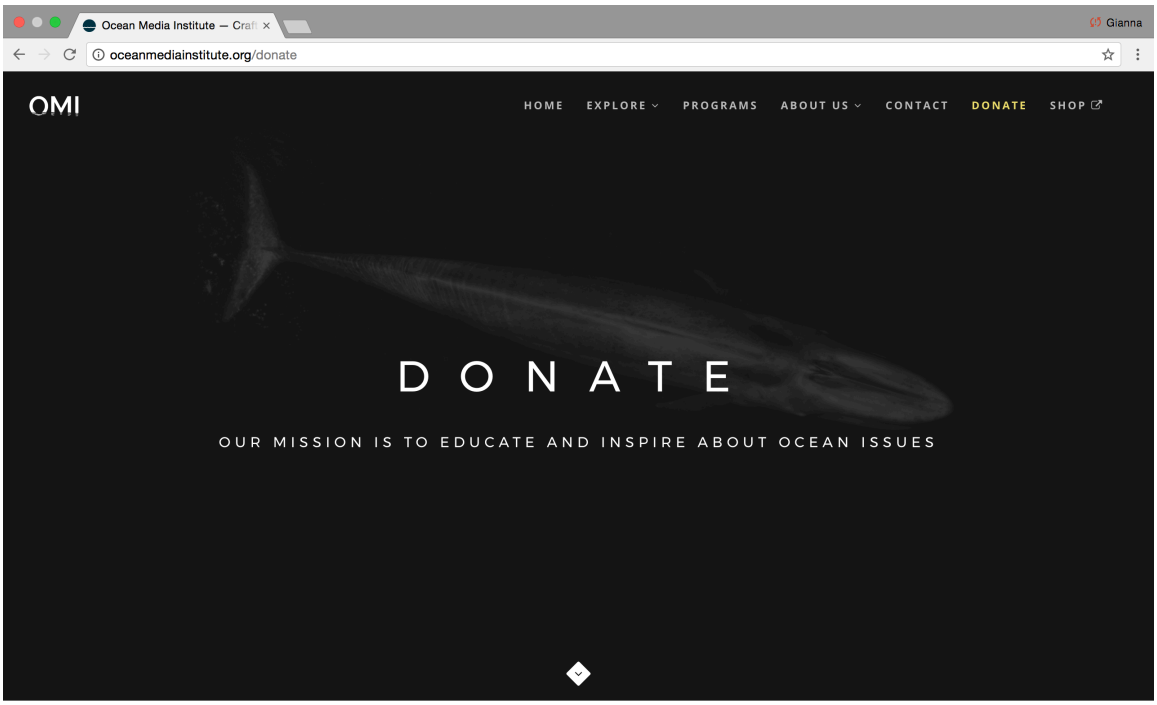
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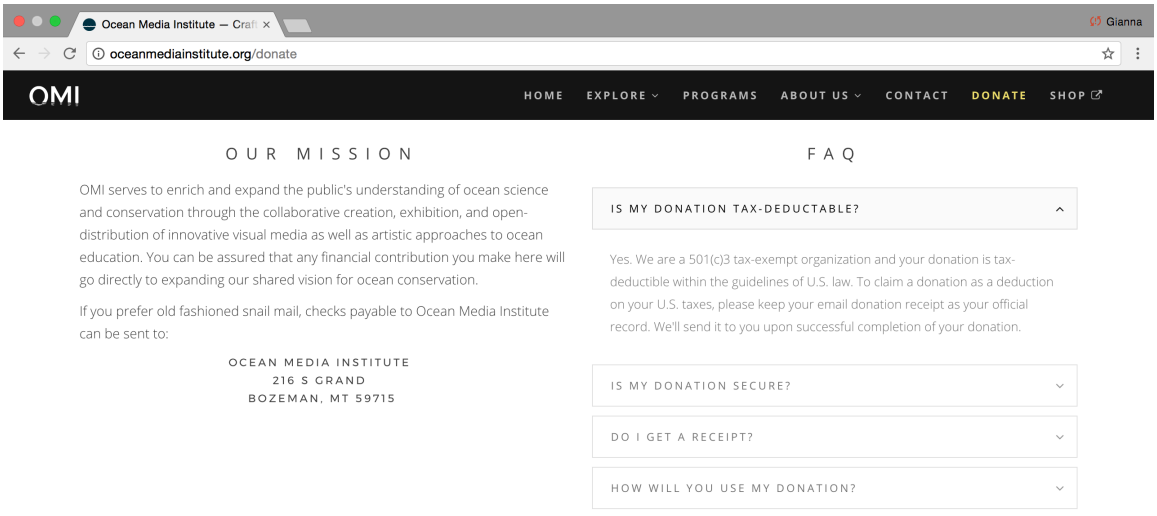

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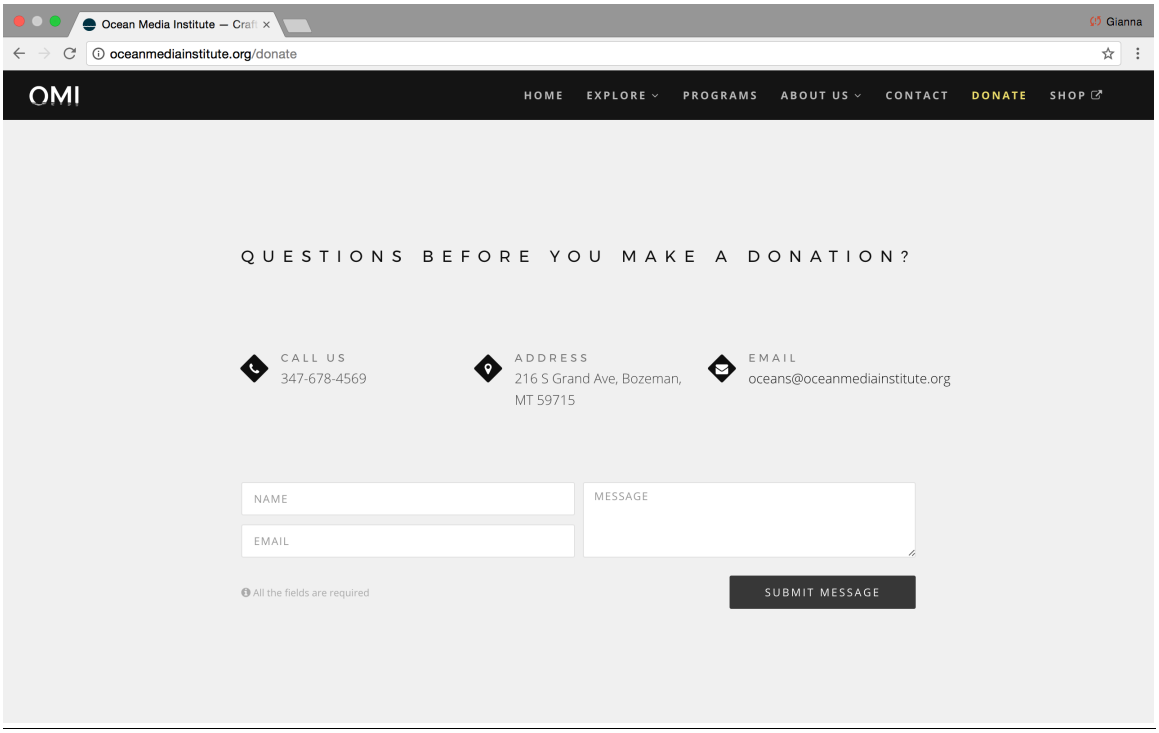

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OMI serves to enrich and expand the public's understanding of ocean science and conservation through the collaborative creation, exhibition, and open-distribution of innovative visual media as well as artistic approaches to ocean education. You can be assured that any financial contribution you make here will go directly to expanding our shared vision for ocean conservation.
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APPENDIX B

SURVEY: TURNING THE TIDE FROM MOVIE TO MOVEMENT

Survey Questions

TURNING THE TIDE FROM MOVIE TO MOVEMENT

1. When it comes to ocean conservation, what issues keep you up at night (3 tops)?

_____
_____
_____

2. On a scale of 1 - 5 (5 being highest), how well do you feel these issues are being addressed in the media? _____

3. On a scale of 1 - 5 (5 being highest), after viewing a film about an ocean issue, how often do you feel you are provided with clear ideas and opportunities to help solve the problem? _____

4. Over the past year, most environmental films I have watched have left me feeling:

a) Empowered to take action
b) Encouraged that there is hope, but not moved to act myself
c) Apathetic
d) Discouraged to the point of feeling helpless to act
e) I can't even watch -- it's too depressing
f) Other: _____

5. As an ocean advocate, how do you try to reach people with your message? (Check all that apply)

a) Theatrical films
b) Television network broadcast (Nature, Nat Geo, Discovery, etc.)
c) Share media with conservation organizations
d) On-demand/streaming video
e) Web-based media (stand-alone video via YouTube, Vimeo, etc.)
f) Print media
g) Social media
h) transmedia
i) teaching/workshops

j) other: _____

6. On a scale of 1 - 5 (5 being highest) how effective do you feel you are in reaching your target audience? _____

7. How do you feel about open distribution of your own media:

a) All environmental media should be freely and openly shared.
b) I would be in favor of openly sharing my media after it has been sold and run its distribution course.
c) I'd be willing to be "selectively open" on a case-by-case basis, depending on who would like it and what they intend to do with it.
d) I am not in favor of open distribution.

8. On a scale of 1 - 5 (5 being highest), to what extent do you value a collaborative effort in your work? _____

9. On a scale of 1 - 5 (5 being highest) how well do you feel minorities are being represented in the environmental film industry? _____

10. To be most effective, I feel Environmental films should:

a) Always include a call to action and provide details of a way to be involved
b) Present the information but not include a specific call to action -- let the viewer decide if and how they want to act.
c) Come out of the gate strong with an issue or problem and spend the film reiterating just how dire the situation is.
d) Make the viewer fall in love with the subject and then introduce the problem/issue.
e) Problem, what problem? Just let me escape for a bit and enjoy the film.
f) Other

11. I find Environmental films are most effective when they use _____ to get the point across (check all that apply):

a) Guilt
b) Sadness

c) Outrage
d) Humor
e) Empathy with characters (human and non)

12. I feel most connected to an environmental issue when I hear it from:

a) An expert or scientist
b) A celebrity
c) An omniscient narrator
d) A victim
e) Other

13. Who do you consider to be the top 3 "tide-turners" in ocean conservation?

_____
_____
_____

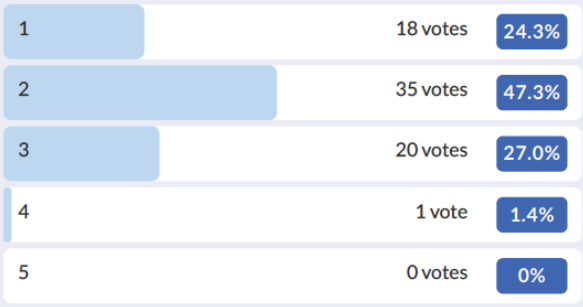
Survey Results

Turning the Tide from Movie to Movement

Created on April 04, 2016 by Gianna Savoie

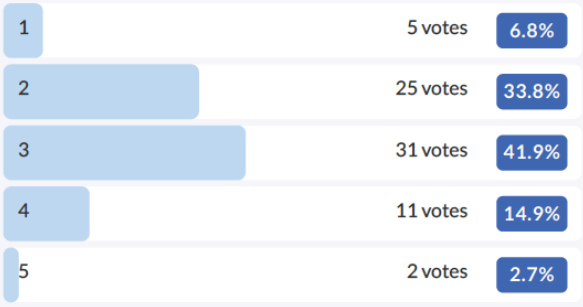
On a scale of 1 - 5 (5 being highest), how well do you feel these issues are being addressed in the media?

74 answers with a median of 2.1



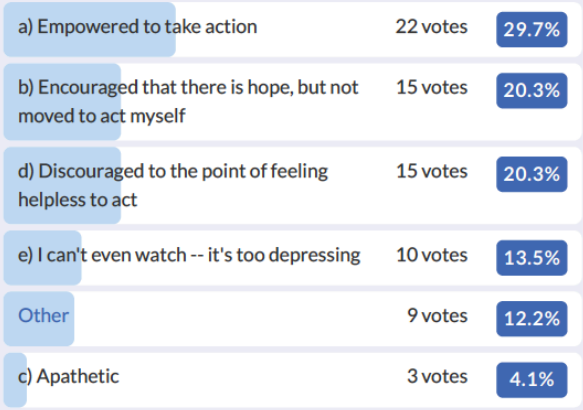
On a scale of 1 - 5 (5 being highest), after viewing a film about an ocean issue, how often do you feel you are provided with clear ideas and opportunities to help solve the problem?

74 answers with a median of 2.7



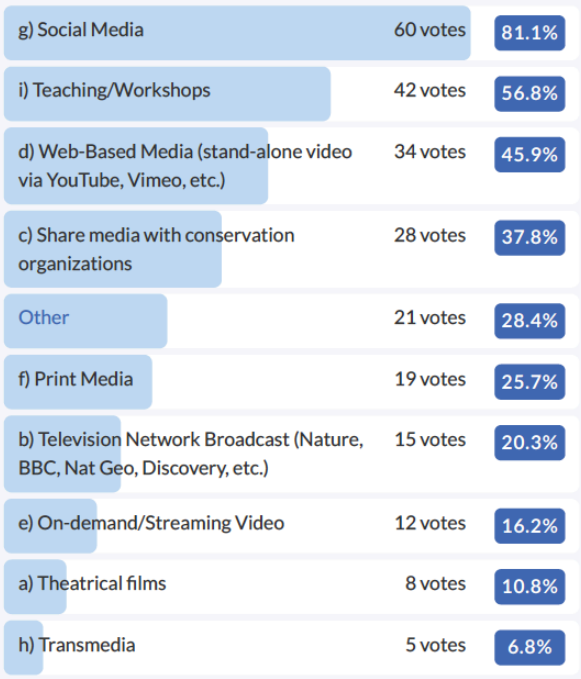
Over the past year, most environmental films I have watched have left me feeling:

74 answers



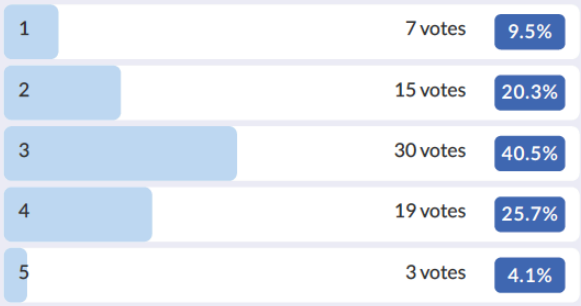
As an ocean advocate, how do you try to reach people with your message? (Check all that apply)

74 answers (244 votes)



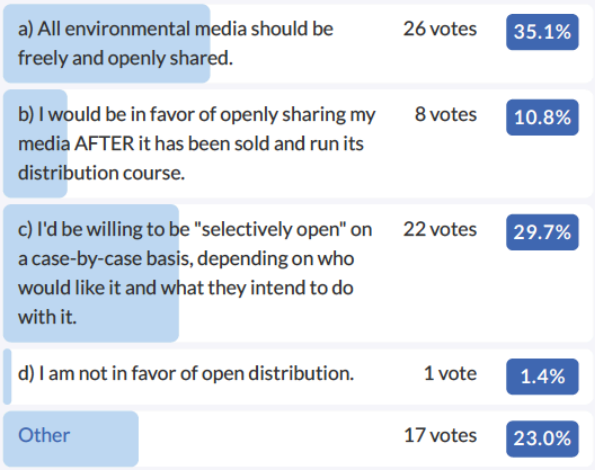
On a scale of 1 - 5 (5 being highest) how effective do you feel you are in reaching your target audience?

74 answers with a median of 2.9



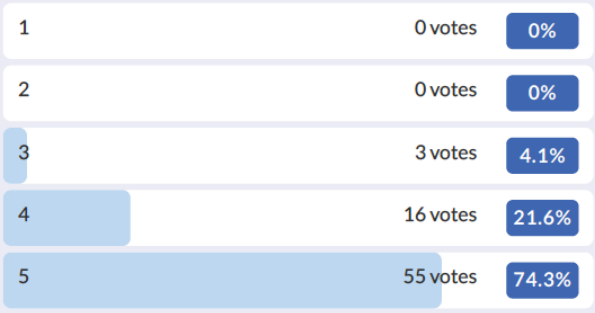
How do you feel about open distribution of your own media:

74 answers



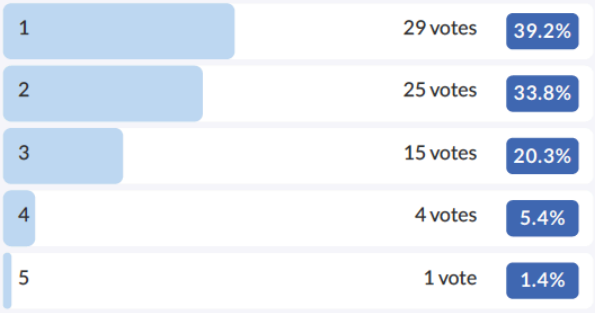
On a scale of 1 - 5 (5 being highest), to what extent do you value a collaborative effort in your work?

74 answers with a median of 4.7



On a scale of 1 - 5 (5 being highest) how well do you feel minorities are being represented in the environmental film industry?

74 answers with a median of 2.0



Fit one full page to window

To be most effective, I feel Environmental films should:

74 answers

a) Always include a call to action and provide details of a way to be involved	41 votes	55.4%
d) Make the viewer fall in love with the subject and then introduce the problem/issue.	18 votes	24.3%
Other	10 votes	13.5%
b) Present the information but not include a specific call to action -- let the viewer decide if and how they want to act.	3 votes	4.1%
c) Come out of the gate strong with an issue or problem and spend the film reiterating just how dire the situation is.	2 votes	2.7%
e) Problem, what problem? Just let me escape for a bit and enjoy the film.	0 votes	0%

I find Environmental films are most effective when they use/employ _____ to get the point across:

74 answers

e) Empathy with characters (human and non)	42 votes	56.8%
d) Humor	14 votes	18.9%
Other	14 votes	18.9%
b) Sadness	2 votes	2.7%
a) Guilt	1 vote	1.4%
c) Outrage	1 vote	1.4%

I feel most connected to an environmental issue when I hear it from:

74 answers

a) An expert or scientist	35 votes	47.3%
b) A celebrity	3 votes	4.1%
c) A victim	11 votes	14.9%
d) An omniscient narrator	4 votes	5.4%
Other	21 votes	28.4%