

The background of the cover is a photograph of a vast ocean under a sky filled with soft, white and grey clouds. A full moon is visible in the upper right portion of the sky. The water in the foreground is dark blue with white-capped waves.

# Ocean Wilderness

People and Environment in the Pacific Islands

Photographs and stories by

**Tyler Hoecker**





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Producing this book has been an exercise in creativity and humility. It would not have been possible without the generous support of my friends, family and fellow travelers. Thank you for your donations, your encouragement, your friendship. I hope this will inspire you to undertake a new project, visit somewhere you've never been, or protect something important to you.

Thank you,  
Tyler



## FORWARD

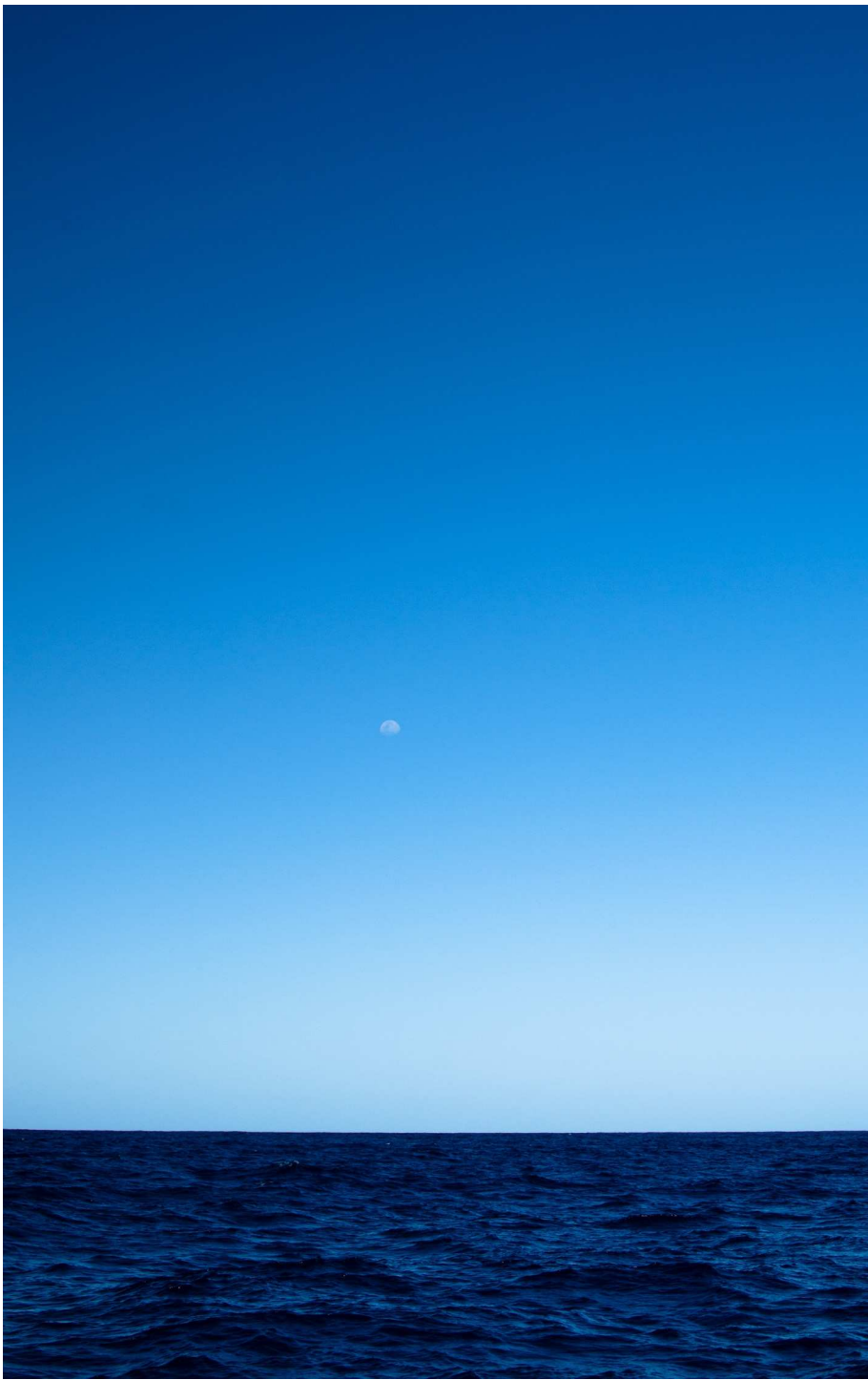
The first time I experienced the ocean from a point beyond a beach or shoreline, surrounded by open water, was a few nautical miles south of Honolulu Harbor. I was away from college for a semester, but instead of a foreign country I had chosen to spend the term “abroad” in an oceanography classroom and on a sailboat. The second half of the semester was spent on the tallship Robert C. Seamans, in the central Pacific. We had spent the weeks prior learning the basics of marine science, the mechanical workings of the ship and her sails, and the seemingly militant schedule of watches we would maintain. The first day aboard, although we hadn’t yet cast off, was nothing less than overwhelming. There were a lot of rules.

Finally, the captain called all hands to throw ropes from dock to deck and lower the dinghies overboard to pull the bow around; we were swinging 135 feet of steel out of Honolulu harbor, bearing 180 degrees south. When I think of that moment I mostly remember the color blue. I recall the deepening of the color as we went out and our bow crashing up and down on the swell. Salt coated my glasses as I braced myself on a teak railing. When I stared far off I could see the Earth rounding away in all directions. What I may not have realized

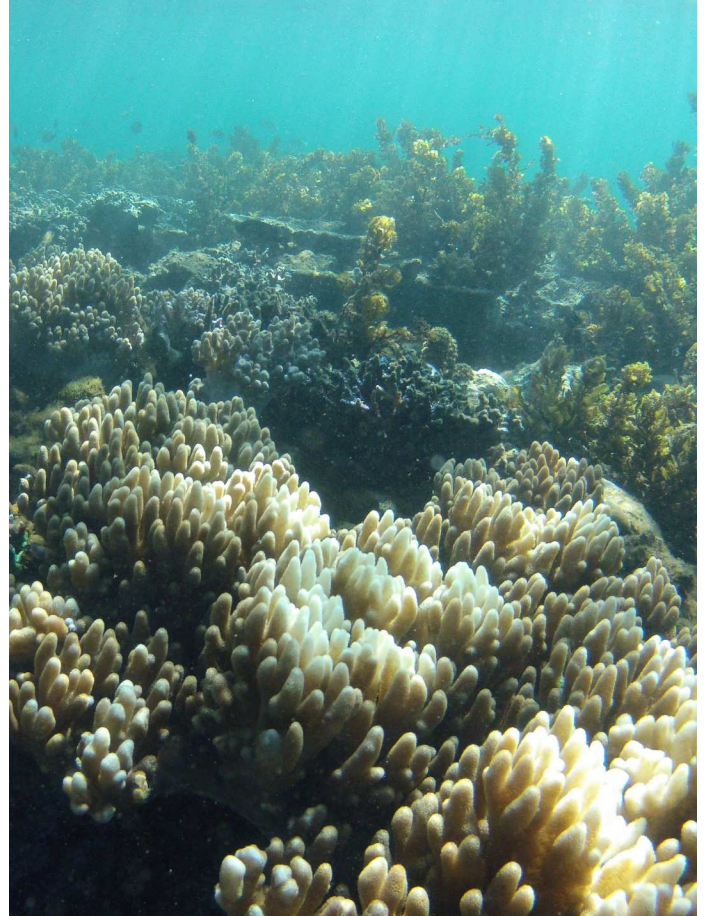
then was that those million miles of black-blue are a single unending body that wraps itself around our planet; they define our Earth. Although our brains have a way of normalizing each successive experience in an environment, when I sit on a boat surrounded by ocean, and stare up into the stars, I struggle as much to comprehend the world beneath me as the universe above me.

When I envisioned myself documenting this trip I thought about the facts I would learn and relay, and the clear, bright photographs I would take. I had forgotten or not yet realized that big, personal experiences like this are inherently difficult to summarize. So, I have struggled to put words to everything I saw and felt and found meaningful while sailing the Pacific. If these defining experiences and places seem nearly impossible to relate, that challenge itself might serve as an illustration of how important wild landscapes, in all their ecological and social complexity, are to us. With this small project I’ve attempted to convey both the snippets of understanding I gleaned during my time at sea and the less tractable mystery that ultimately connected me to ocean wilderness.









### **Taha'a moon**

*A faint moon rises over the reef off Taha'a, French Polynesia. For one of our first anchorages of the trip we nestled our hook into the sandy bottom that gently slopes from the protective ring of coral to the island's shore. Taha'a is a small island that shares its lagoon with Raiatea, both part of a group called the Society Islands of French Polynesia. All of these islands feature a steep volcanic landmass surrounded at a distance by reef. Perhaps better known in the group are Bora Bora and Tahiti, the Societies were named by James Cook whose expeditions are famous as the first in the region by a European. Much has been written about Cook, but my conclusion is that what he brought to the islands was both good and bad, and regardless, irreversible. He initiated a shift in Polynesian culture that is still in motion.*

### **Black and white hibiscus**

*The Societies had too many species of hibiscus for me to properly identify. This one sat unassumingly along a hedge of vibrant flowering bushes that lined the road from Opunohu Bay to the crater rim in Mo'orea.*

### **Butterfly fish**

*Butterfly fish are abundant around coral throughout the Pacific. These were spotted in Ha'apu Bay, Huahine, French Polynesia.*

### **Coral**

*Of any organism, coral defines the South Pacific more than any. Coral are large colonies of invertebrate animals, individually called polyps. Most coral earn their living through a relationship with algae that live within them and photosynthesize sunlight. Coral, or their skeletons, comprise most of the islands (coral islands are often called atolls) that human communities inhabit. Their reefs provide a permanent ecosystem for the multitude of species that never venture into the pelagic, and periodic respite for those that do.*

*This is the Palolo Deep marine reserve in Samoa. We spent many of our marina-bound days in the water here. One of my most memorable animal encounters of the trip happened here when I snuck up on a feeding Hawksbill turtle. He continued to munch for what seemed like ages, but was probably only a minute, before realizing my presence and scooting off into the maze of reef.*











### **Opunohu bay**

*The view from a popular anchorage just outside Opunohu Bay, Moorea. The bay is famous for sheltering James Cook and his Bounty for several weeks as they explored Mo'orea. The societies are somewhat unusual in the Pacific because they are volcanic rather than coralline. The bay was formed and is surrounded by the massive crater that was created after the eruption of Mo'orea's ancient volcano.*

### **Artist**

*A local artist on Huahine, French Polynesia hand paints a lava-lava (a traditional fabric wrap that we might know by the Indonesian name, sarong).*

### **Outriggers**

*Tahiti is French Polynesia's largest and most populated island. The marina is packed with visiting yachts and the locals use the protected bays for paddling. Polynesians have been building and paddling outrigger canoes for thousands of years. Watching the teams come out each evening reminded me of football and soccer practices as a kid. Here in Tahiti, kids learn to paddle a canoe instead of throw a ball, and teams come in all shapes and sizes.*

### **Pape'ete**

*A woman sells me pineapple at the market in Pape'ete, Tahiti. Two men play ukulele for change in the center of town.*

### **Flower**

*Wild hibiscus petals float down from Fa'aroa, the only navigable river in French Polynesia, and out into the lagoon.*

### **Mo'orea**

*Another view of the island of Mo'orea as we sailed away from it, and a sunset from our anchorage near Opunohu Bay.*









## OCEAN, PLANET, UNIVERSE

When I try to think of an analogy for the ocean that could make it more tangible, I think about space. It doesn't help much. Still, humanity's relationship with the two has been similar, and I see the exploration and search for understanding in space and the oceans as closely related endeavors. Our adventures into ocean wildernesses are much older, to be sure, than into space. But the former paved the way for the latter, and the technologies, ideas and audaciousness required are the same for both frontiers.

In the work *Cosmos* by the famed theorist Carl Sagan, references to Earth's ocean are many. In this treatise on the Universe, Sagan describes the relationship both mathematicians and sailors had with the Cosmos, with the stars and bodies that traversed the sky along predictable pathways. The quest to circumnavigate the world under sail evolved alongside our understanding of the workings of our planet, solar system and interstellar space. Today's idea of "new worlds" on other planets shares not only common language, but reflects the same desire explorers during the 15th and 16th centuries had to search for new frontiers here on Earth.

In 2011 I heard Neil deGrasse Tyson, one

of today's most adept communicators of astronomy, in an interview with NPR reacting to the substantial budget cuts faced by NASA. The federal government had just announced that the U.S. would cease sending manned craft into space. Our astronauts would continue to explore, but with tickets on Russian shuttles. The federal government, and much of the American citizenry besides, had begun to reevaluate the costs associated with manned spaceflight. Folks asked if perhaps those billions weren't better spent here on Earth, helping to solve the discrete problems troubling this planet's population.

It was in this context that Tyson recounted Apollo 17, the last of NASA's lunar missions, and an important image taken by the crew on their way to the moon. Affectionately titled "Big Blue Marble," this image would be the first clear photograph of a full, illuminated Earth. It shows a seemingly perfect sphere, dappled with blue, white, brown and green. Now ubiquitous, we saw for the first time the singular nature of our planet, resting amid the deeply black void of space. Tyson contends it was this image and others like it that catalyzed the environmental movement here on Earth. He said:

*"All of a sudden, we all looked at Earth not as we*

*do in the classroom with all these political boundaries etched within it. We looked at Earth as this ball with just land, water and clouds. And all of a sudden, there was a oneness to it that no one thought to think before.”*

By seeing our planet as a whole, the one shared home of all humanity, something switched on inside us. A planet that once seemed endless in its supply of life-giving resources and its ability to meet our demands was stripped of this illusion of immortality. Suddenly our home was finite, and maybe unique, in its capacity to provide for us.

When I hear discussions of the ocean and its resources I hear a tone similar to that which most of the Western world had for the terrestrial Earth until the mid-20th century, before the modern environmental movement hit its stride. Because the ocean is so geographically vast, its supply of life seems equally boundless. But in the same way that we’ve realized the limits of earth, there is a changing paradigm about the ocean. We have begun to question what we thought was the guaranteed ability to recover from even the most dramatic declines in diversity and abundance. The shocking thirst with which we pursued –and in many cases still pursue – the ocean’s inhabitants has been adjusted for many

species. This is thanks to committed scientists, explorers and documentarians that motivated citizens and policy-makers to promote change, and sought to put things in terms and images we can understand. Spending time and money probing the depths of places as foreign as the pelagic ocean or deep space can seem ridiculous, but the perspective that can be gained when we look back at ourselves from a distant place has been invaluable. We are indebted to those who took the time to explore along the fringes of our world.

## **THE SEA**

Before I left for Raiatea, one of the Society Islands of French Polynesia and the starting point of my journey, my dad gave me a copy of Rachael Carson’s *The Sea Around Us*. I was grateful because not only had I done a poor job of compiling good ocean literature, but Carson’s book is a classic in popular science writing. Carson was an early advocate for many overlooked systems, including marine environments, and helped to expose the public to the ocean at a time when it was even less understood than now. Aside from its scientific insights, it is beautiful prose. One paragraph in particular struck me as deeply true and very

appropriate for a green sailor like myself. Of man and oceans she said:

*“And yet he has returned to his mother sea only on her own terms. He cannot control or change the ocean as, in his brief tenancy on earth, he has subdued and plundered the continents. In the artificial world of his cities and towns, he often forgets the true nature of his planet and the long vistas of its history, in which the existence of the race of men has occupied a mere moment of time. The sense of all these things comes to him most clearly in the course of a long ocean voyage, when he watches day after day the receding rim of the horizon, ridged and furrowed by waves; when at night he becomes aware of the earth’s rotation as the stars pass overhead; or when, alone in this world of water and sky, he feels the loneliness of his earth in space. And then, as never on land, he knows the truth that his world is a water world, a planet dominated by its covering mantle of ocean, in which the continents are but transient intrusions of land above the surface of the all-encircling sea.”*

Carson is talking about the same process, a struggle with identity perhaps, that I had aboard the Robert C. Seamans heading south from Honolulu. She helps us realize, like Tyson, the small place in the Universe that we and our

planet occupy. Exploring space and exploring the ocean are both pursuits have afforded us this important perspective. I think she is also challenging us, however, to avoid the temptation of labeling and categorizing in order to appreciate. There is an inherent connection we can find in nature that doesn’t rely on complete understanding. It is the mystery, even, that is often so compelling.

I spent some hours with *The Sea Around Us*. It quickly became clear that our knowledge of the world’s ocean has changed considerably since the book was first published in 1951. Most oceanographic tools were borne from military technology developed in the world wars, and when Carson published her book their use for scientific purposes was still nascent. From my 21st century perspective I found myself sorting each sentence and its facts into categories. Some were simply and plainly false. Others have become clouded by additional insights gained during the proceeding decades. A rare few objective statements remain wholly true. When Carson wrote *The Sea Around Us* the scientific community hadn’t yet adopted what is today the foundation of all Earth science, tectonic theory. Tectonic theory explains that the Earth’s surface is comprised of many plates that float on a plastic (semi-liquid) mantle, constantly grinding past, under and over one



another. Carson describes the origins of the Earth and oceans in terms of a series of mountain building events, the whole process having begun only about 2 billions years ago. Besides the theory of moving plates, we know the Earth is 4.6 billion years old and undergoing constant geologic changes.

Carson was a contemporary of Thor Heyerdahl, the Norwegian ethnographer famous for his *Kon-Tiki* expedition. Heyerdahl hand built a wooden raft and sailed it from South America to the Tuamotus Islands to prove that ancient humans could have migrated long distances and make contact with widely disparate cultures. This idea is promoted in *The Sea Around Us* and is still discussed today, although it has since been disproven as the method by which the Pacific islands were populated (see *Migration*).

In the introduction to his chapter in the National Science Foundation's volume *50 Years of Ocean Discovery*, Walter Munk says that, "going back to the early 1950s is like going back to Exodus." Indeed, almost everything about how we understand and explore the oceans has changed in the last 60 years. From the motivations for conducting research to our interpretation of its results, the ocean has been a broad frontier for scientific development. It was likely the blooming of marine research that

began in the 1950s and reached full stride by the '60s that motivated Carson's book.

My 1961 revised edition of *The Sea Around Us* includes a preface that acknowledges the issue of our evolving understanding of the ocean and an appendix of updated facts. My academic training had emphasized critical thinking, but that tendency was becoming a burden when stranded with a 60 year old work of nonfiction in the middle of the Pacific. Eventually though, *The Sea Around Us* taught me something more important than the list of updated facts in the appendix. It allowed me to realize that our understanding of the ocean, and of the Earth's evolution at large, is dynamic. What we believe to be the truth about its processes and inhabitants is in constant flux. Concepts are regularly tested, updated, and thrown out altogether; that is the process of science. This doesn't mean that what we now know will soon be proved wrong, or that science from decades passed is no longer valuable, but it frees us from a dependence on being right. It means that understanding our world is an ongoing and never-ending process. Bioluminescence, the emission of light from an organism, serves as another good example of the way our understanding of marine environments continues to evolve through time. Carson describes it as it has appeared to

us for most of human history:

*“Yet there are lights that flash and fade away, lights that come and go for reasons meaningless to man, lights that have been doing this very thing over the eons of time in which there were no men to stir in vague disquiet.”*

Today our explanation of the chemical mechanisms that create bioluminescence and its utility to marine animals is becoming a bit clearer. The chemical reactions between proteins and enzymes within an organism are complex, but fairly well explained in the scientific literature. Bioluminescence seems to occur more in the oceans than in terrestrial ecosystems (including lakes), and is exhibited by a huge variety of animals. Likewise, its functions are equally broad.

Most simply, researchers believe luminescent glows are meant as attractants and flashes are meant to repel. Scientists hypothesize that marine animals use bioluminescence for everything from vision to camouflage; defense, as “burglar alarms;” communication, to warn predators; and to attract prey. Its uses, clearly, are varied and it’s often used in multiple ways by the same organism. The phenomenon is difficult to study, however. Reproducing the natural conditions

for luminescence in a laboratory is challenging, and extrapolating the results of controlled studies to natural environments may not be valid. It’s a phenomenon that remains as fascinating now as it always has, and provides ample opportunity for future discovery.

It is not necessarily human nature to explain with logic and reason, but it is a method to which we have become deeply accustomed. Especially in regard to the natural world, to examine the biosphere any way but empirically is seen as subjective, biased and superstitious. Through time and hard work we may build our scientific understanding of our natural environments, and in fact we ought to. However, I am certain that we may never fully know the intricate ways marine life cooperates, competes and evolves in our oceans. Moreover, the value of any ecosystem exists before and independently of our ability to catalogue and analyze it. What makes Carson such an important author was her ability to balance an analytical mode of thinking with a spiritual one. Similarly, my experience suggests that there is value in simply seeking; we should foster an appreciation for mystery of our natural world and a thirst to explore alongside the categorical aims of science.

## WILDERNESS

Because this book is meant to promote an idea of ocean as wilderness, considering some ways that wilderness has been defined is appropriate. Merriam Webster describes wilderness as (1)“uninhabited by human beings,” and “(2) essentially undisturbed by human activity, together with its naturally developed life community.” Deep in the text of the definition, the authors add that “an empty or pathless area or region” could qualify as wilderness, even “a confusing multitude or mass: an indefinitely great number or quantity.” The latter descriptions, to me, seem the most relevant in the context of the ocean. After all, the ocean is certainly not without human inhabitants and actors, and far from undisturbed. A “naturally developed life community” still exists nonetheless. When I envision the open ocean that characterizes not just the south Pacific basin, but much of the world’s ocean, emptiness and pathlessness are the first images I see.

Beyond the dictionary, much has been written on the concept of wilderness, but it is largely confined to a terrestrial context. A query of peer-reviewed scientific literature produces some 800,000 publications with references to “wilderness.” Yet succinct

definitions of what in fact constitutes wilderness remain vague and elusive. In terms of an academic definition, it seems a lack of humanity is the closest thing to a consistent requirement. William Cronon, in a progressive critique on traditional ideas of wilderness, asserts that wilderness is an essentially artificial creation of modern culture. He rejects the claim that the actually or artificially bounded landscapes we call wilderness are truly free of impact by humanity. Instead, many of the places we consider to be wild in fact have experienced a long history of human influence, and often inhabitation. Further, he says, a definition of wilderness that excludes people lacks the ability to promote positive change. Our definition of wilderness has been further confounded by the rapid rate of human-induced environmental change occurring globally. Modern sources of pollution, like carbon and nitrogen, disperse readily across the planet and ignore the dotted lines we’ve drawn to delineate wilderness areas.

Despite Cronon and other scholars’ critique of the wilderness idea and the ways we use the term, I still embrace it. I think it’s valuable because it suggests unlimited potential for knowledge and exploration of places, whether deep ocean trenches or jungle canopies, where humanity has still only approached the fringes.

Importantly in the context of this book, these ideas about what constitutes truly wild places are almost exclusively terrestrial. The idea of applying the wilderness concept to ocean environments is difficult to trace. Maybe it's just a trendy new term for characteristics of the ocean that have long been recognized by fishermen, sailors, scientists and other communities tied to it. When I first heard the ocean described as wilderness, something clicked in my head and began to change my perception. I had previously ignored many of the features of ocean environments that fit so well into the wilderness criteria: unexplored vastness, biodiversity, and importance to the larger Earth system.

Applying the wilderness concept to the world's ocean could be useful in both practice and principle. Wilderness designation given to terrestrial ecosystems (mainly forests) in the U.S. allows a specific set of regulations to be applied to those areas. When an area is designated as wilderness, protections against residential and industrial development, mechanized recreation and other potentially destructive uses are put in place. In the U.S., ocean and coastal environments that are under legal protection are broadly classified as Marine Protected Areas (MPAs), which can include a variety of specific restrictions on use.

Marine *reserves*, however, are distinguished as “no take” areas where most extractive activities, like fishing and mining, are prohibited. Of the 1,600 MPAs in the U.S., only 223 are marine reserves, totaling 3.1% of U.S. waters. It's important to know that over 95% of that marine reserve area is part of the

Papahānumokuākea Reserve in the northwestern Hawaiian island chain, established by George W. Bush and expanded by Barack Obama. Without that relatively recent addition to the marine reserve network, federal protection of coastal and ocean habitats in the U.S. would be quite limited. The terrestrial counterparts to marine reserves, wilderness areas, include 662 areas totaling nearly 5% of U.S. land area. Either forest resources became scarce enough to warrant protection more quickly than marine resources, or we live in a culture that fails to recognize marine environments as worth our protection. It is likely a combination at play; the limitless perception we have of the world's ocean fuels both.

The reason I've clung to the idea of wilderness and sought to apply it to the ocean is that I hope a wilderness paradigm might change our view of this important environment in positive ways. It might help us to appreciate ocean ecosystems like we do ancient redwood

forests and high alpine meadows and expansive tallgrass prairies: for an inherent value that precludes utilitarian function. Especially if we use more contemporary definitions that *do* incorporate human interaction, I think a re-categorizing of our oceans as more than fish factories and carbon sinks might serve as an important stepping-stone toward their preservation.

Protection for marine wilderness is hugely important to ensure their continued functioning and diversity, but it's the ocean's interconnectedness that makes it particularly vulnerable. Marine debris, sometimes called the "garbage patch," is probably the most visible effect of humans on marine environments. The folks at Papaha-naumokua-kea Marine Reserve, our best example of marine protection in U.S. territory, still collect about 52 tons of derelict fishing nets every year. Heartbreaking photos of marine animals tangled in these nets are ubiquitous, but the garbage also wreaks havoc on corals as it rolls through the ocean and smothers growth on the floor once it sinks.

Disparate connections between the causes and consequences of environmental challenges can be difficult for scientists and environmentalists to convey. Before acid rain became household vocabulary,

environmentalists were hard pressed to prove that sulfur produced by a steel plant in Indiana could destroy hardwoods forests in Vermont, as was described in Bill McKibben's *The End of Nature* and now in every introductory environmental science textbook. Again today the impacts of increased carbon in the atmosphere on climate illustrate that modern forms of pollution from individual point source can have far reaching ramifications. The accumulation of marine debris is a spatially and politically vast challenge that, like atmospheric carbon, will be nearly impossible for humanity to reverse. But, we can reduce the rate of change and the magnitude of our impacts, and we can focus our resources on understanding and adaptation.

## **Tongrareva**

*Islands in the Pacific come in two distinct forms. Islands like Tahiti and Mo'orea are volcanoes of varying age, composed of dark igneous rock, featuring large craters and other obvious signs of their volcanically active past (and in some cases, like much of Indonesia, present). Atolls, however, are made up of the skeletons of dead coral animals. Fringing coral reefs form around volcanic islands, which eventually erode and become submerged, leaving only a horseshoe-shaped ring of coral structure behind. Atolls typically rise only a few meters above sea level, and as such will be among the first nations to experience profound impacts from sea level rise. Tongareva, or Penrhyn, is a remote atoll in the Cook Island group.*

*The Cook Islands are a group of atolls spread across a broad swath of the south-central Pacific. We were the fourth boat of the season to visit the northernmost island, home to some 200 people. Most atolls are partially submerged, creating many small islands called motus. On Tongrareva, only two are large enough to support communities. We spent all but one day in Te Tau Tau, Tongareva's leeward (eastern) village.*

## **Milkfish**

*Sharing resources communally was important in*

*the village we visited, Te Tau Tau . This woman is dividing a day's highly successful catch of milkfish - a dump truck full of fish were netted-into equal shares for each household in the village. We were included in the division of food. The community insisted we join them for a number of large potluck lunches, and every time a boat returned with fish we were delivered a share.*

## **Mr. T**

*Our host self-appointed host and village mayor, Mr. T, prepares surplus milkfish, which is fileted, scored and heavily salted before being laid to dry in the sun. This popular snack would be sent to relatives in the more populated of the Cook Islands, where milkfish were less abundant.*

## **Tongarevan homes**

*Consistently warm weather means life on a Pacific island is lived mostly outside. Kitchens like this one were typical. Homes are simple, cement block constructions. Everything is made "by hand," that is, there is nobody to hire or contract work to. We spent two days alongside every able-bodied hand in town helping a family build a new cement pier.*

















### **Portraits**

*The Cook Islanders are closely related to New Zealand Maori and are thought to have been the first Polynesians to settle New Zealand. We found them to be an incredibly generous, welcoming community.*

### **Elder**

*Cook Island women specialize in handmade hats and other woven crafts made from dried strips of young coconut leaves. They sit on mats under a shaded cement pavilion, chatting and weaving for most of the day.*

### **Frangipani**

*Although commonplace, I couldn't help but take special notice of the frangipani and other tropical flowers that littered the ground throughout Polynesia.*

### **Mrs. T**

*Mrs. T shows off her rito hats. This one features a mother of pearl top piece. They are mostly sent to the busiest of the Cook Islands, Rarotonga, where they're sold in markets.*

### **Church**

*For me, Polynesia can be described by two main ideas: religion and migration. Both have been the drivers of Pacific culture for hundreds of years in*

*the case of the former and thousands for the latter. Native pastors introduced Christianity by way of the London Missionary Society in Tongareva by 1854 and Protestantism has been popular on the island ever since. As guests of the community we were expected to, and did, attend church each Sunday. Following the services, we would be invited to join the minister's family in his home for lunch.*















## MIGRATION

One of my favorite activities aboard the boat was to imagine the first people to sail the Pacific. I'm not referring to Captain James Cook, although his accomplishments were significant. His name is everywhere, his impression is lasting, but he was a few hundred years behind in his discoveries.

Anthropologists have used a variety of strategies to determine who first inhabited the Pacific islands and when they arrived. Human genetics, buried seeds, pottery shards and languages are some of the archeological clues used to fit together this long-standing puzzle in human history. Much like the study of ocean ecosystems, red herrings have existed, but we now have a pretty clear idea of how the Pacific islands were populated.

Polynesians and Micronesians are descended from people that left Southeast Asia 50-60,000 years ago and migrated to Melanesia, which includes the islands around northern Australia, eastern Indonesia, Papua New Guinea, and others. Those people are referred to now as Lapita and are recognized by their distinctive pottery. Further migration eastward is thought to have occurred in two waves, the first populating Samoa and Tonga, the second the Cook Islands, French Polynesia and lastly

New Zealand. The presence of potatoes in the Pacific suggests that the Polynesians even made it as far as South America, where the vegetable originated, and returned home.

An element of the Polynesian's history that confounded our understanding until relatively recently is their direction of travel. Modern sailors follow the trade winds – a consistent band of air that moves east to west across the oceans – when they cross the Pacific. The Polynesians took advantage of periodic weakening in the trades, or altogether shifts in the main wind direction, and sailed west to east. These anomalies are thought to have occurred during ENSO (El Nino Southern Oscillation) events, anomalies in the distribution of sea surface temperatures that affect global weather patterns. Some experts speculate that this would have allowed them to make an easy return to their home islands, via the more typical east to west trade winds, if conditions on new islands were unfavorable. Regardless, sailing in any direction across thousands of miles of ocean without any modern navigational equipment would have required generations of careful observation and developed nautical skill.

Although many of the techniques of ancient Polynesians have been forgotten, there is no dispute that their methods of navigation

were sophisticated. The Pacific islands are isolated places thousands of miles apart and arriving at them by luck would be nearly impossible. Evidence indicates that the Polynesians traveled with family groups, livestock and the provisions they'd need to start new, permanent communities. We know that these journeys weren't accidents; they were taken with intention and purpose.

Exactly why they decided to disperse is impossible to know for certain, but disputes between families, overcrowding and the resulting competition for resources on already resource-scarce islands were probably factors. Importantly, scholars also point out that the voyages wouldn't have happened if the Polynesians weren't curious, brave and adventurous.

What I came to learn is that migration provides the context for and continues to define the Polynesian people, and importantly, the ocean they call home. They have continued to spread themselves across the wider Pacific and throughout the world. More Polynesians live in Australia and New Zealand than any of the smaller islands. Like immigrants in other parts of the world, they have left their homes in search of reliable jobs and the modern, comfortable lifestyles that we also enjoy.

## RELIGION

Wolfgang is a German expatriate who runs a small dive shop and lodge on the island of 'Eua in Tonga. When you walk into the open dining room he's built you have to remind yourself you're in Tonga, because the stone hearth, hand-planed cedar paneling and long benches feel like a quaint respite in the forest of Germany. Wolfgang is handy, eccentric and deeply religious. He's all but abandoned hope for our world, which he sees as the work of Satan. Armageddon is imminent. Despite such a fundamentally pessimistic worldview, Wolfgang is kind and hardworking. I have a hard time accepting the idea that we're destined for any life but this, so I had trouble accepting many of his beliefs. But when we came to the topic of belief in God, and how Tongans so differ from Westerners in their unwavering belief, he offered some valuable insight.

Tonga is the most Christian country I have ever personally experienced. Amid visitations by explorers, whalers and slavers, the Pacific islands entertained a great many missionaries. Although Tonga is the only Pacific island nation to have never been run by a colonial power, the missionaries found as much success here as elsewhere in the Pacific. The

church has remained a powerful institution ever since the wave of acceptance passed over the Pacific islands. There is an array of anthropological explanations for why the islanders so readily accepted Christianity. Most scholars will say that the existing religion prophesied the coming of a new faith and the existing social hierarchies fit easily into those of the church.

Wolfgang had an additional thought that seemed to hold some truth to me. He said that in the West we've chosen to abandon God for our own cleverness. Who needs a God when the advances of medicine have so improved our health, when technology provides endless entertainment, and science explains the processes that happen around us? If you live in a country that lacks these provisions, the presence of God in your life becomes more important. I'm not sure what it is about this explanation that so appeals to me, but I think it has something to do with my own dissolution with the rational mind that dominates my own culture. I started to wonder if everything we encounter can be explained away or if there isn't an inherent mystery to the world that science will never resolve. So maybe when you find yourself in a place where the voids we inevitably encounter in life aren't easily filled up with stuff, there is room left for God. In

Tonga there is still room for God in people's lives.

## W H A L I N G

It was a Sunday in Tonga, so everything was closed. Jan, a Czech expat from New Zealand, Nico, a tourist from Japan and I had decided to forgo church. We opted instead to walk the few miles to a resort that is allowed to remain open on Sunday and, even more appallingly, to sell beer. Along the way we collected a loud, redheaded woman from Melbourne, a full-time dog-walker by trade, who looked in need of company. Off into the tropical midday heat the rag-tag *palangi* (tourist) crew went, planning for a quick snorkel and a cold beverage.

We sat in a rough circle on the beach, mai-tais and lagers stashed haphazardly in the sand around us. Remember that this group of near strangers has traveled thousands of miles and spent many thousands of dollars to be here almost exclusively for the privilege of getting in the water and swimming for a few minutes with humpback whales. When this group of tourists sits down to talk of a Sunday afternoon, the topic of whaling – that is, the harvesting, culling and killing of whales for food or

otherwise – is one of the inevitable topics of discussion that can only be avoided for so long.

Whaling is an ancient practice. Scholars estimate that whaling took place as early as the 11th century in the North Atlantic and the 16th century in Japan. Whales of all species have been subjected to considerable devastation from overharvesting. Before the advent of petroleum oil, whale oil was highly prized for the many uses you might expect of a high-energy, liquid fuel. The whale's bones were popular for their use in a critical piece of wardrobe, the corset. But when petroleum based oil was introduced in the 1850s (much debate exists about whether the change was due to a shortage in whale oil or government support of the petroleum industry) whale oil lost its niche. Then the Great War broke out and suddenly a whale product called glycerin became useful in the making of bombs. Whaling was again highly profitable and new, steam-powered vessels enabled whalers to hunt with greater efficiency and catch faster moving species. Whalers from around the world took to the rich Arctic feeding grounds and hunted with what can fairly be described as ravenous disregard.

As whale populations plummeted, concern from the world community grew. In 1930 the Bureau of International Whaling

Statistics was set up to keep a record of whale populations, and a series of conventions were held throughout the '30s to establish an international consensus on whaling regulations. In 1946 the International Convention for the Regulation of Whaling took place in Washington, D.C. and the International Whaling Commission (IWC) was established to develop and enforce guidelines on the harvesting of whales. In 1982 the IWC established a moratorium, or ban, on whaling and scheduled it to take effect in 1986. Japan, Norway and the USSR issued objections to the ban and continued to harvest whales.

Significant effort by the scientific community has been made to develop an estimate of great whale populations based on records of harvesting during the 20th century, but widespread falsification of those records has made the task difficult. Harvest data released after the Cold War inform current estimates that more than 2 million whales were harvested in the southern hemisphere alone over the century. No such estimate is available for the northern hemisphere. The large-scale whaling that followed WWII has had cascading effects across marine ecosystems. One example is the link between whaling and declines in seal and sea lion populations. Killer whales, or Orcas, used to eat the great whales, but



transitioned to seals and sea lions when the great whales became scarce. Subsequently, seals and sea lions now comprise a larger portion of the killer whales' diets, and have suffered as a result. A tangled web of interconnections links marine species, and the cascading effects of removing a major component of that system continue to be revealed.

While the IWC's moratorium has been successful at slowing the rate of decline in some species and preventing the taking of others, it has been fraught with controversy. Japan in particular has, since 1988, taken advantage of a loophole that allows harvesting of whales for scientific research. The practice has been widely criticized by activists, scientists and countries that honor the moratorium. Most publicly, NGO's like Greenpeace, and a marine-specific offshoot group called Sea Shepherd, have attempted to interfere with Japanese whaling in the Southern ocean. Reminiscent of other poorly conceived disguises for taboo practices, the façade of whaling for scientific research hasn't fooled many. The right to indulge in a cultural pastime could be seen as a more legitimate justification, but has so far been an ineffective defense for the nations opposing the moratorium.

Camera fades back to this rag-tag group

of whale-swim tourists, the small slice of humanity I'm sitting with, that is in unanimous agreement when the subject is broached that the so-called research being done by the Japanese is fundamentally wrong. Further, the direct action of Sea Shepherd is necessary and important work. Sea Shepherd was founded by Paul Watson, who decided to split from Greenpeace because he viewed their approach as toothless, ineffective and totally not radical. Sea Shepherd posits that only direct action – as in physical antagonism and confrontation – against Japanese and Norwegian whaling vessels will stem the harvesting of whales. This is where I decided to jump in and advocate for the devil. I don't take issue with Sea Shepherd's approach; I agree the policies of the IWC have been ineffective and I love and respect whales. But the more I learn about whaling, its history, the cultures that practice it, the more uncertain my convictions about the best approach to ending whale harvesting become. Shaming the nations that value products derived from dead, rare wildlife doesn't seem to be working.

The fact that the international community needs to work together to address and improve this situation is without doubt. What I fear is that the IWC's policies have not only failed to end the harvest of whales but have ostracized some nations to a point that

jeopardizes diplomacy in the future. These policies have resulted in the trading of IWC votes for international aid, and general dishonesty amongst IWC nations.

The issue of whaling comes back to the same fundamental question as so many other ocean resources: how do we manage resources that exist mostly outside of national boundaries? The ocean is an inherently shared space. Although 35 percent of the ocean lies within U.N.-defined “exclusive economic zones” extending 200 miles from the shoreline of every nation, most of the ocean, and what amounts to a significant portion of our planet, is outside the sovereignty of any country. The tragedy of the common resource as old as civilization; we struggle to limit ourselves to just our share when nobody is watching. Whales are large, charismatic creatures that have incited particular concern from the public, but overharvesting continues to threaten a range of marine species. The collapse of the Atlantic cod fishery in the early ‘90s is now a classic example of the devastating, long-term impact of rampant overharvesting, and the global appetite for sushi threatens to make tuna a delicacy of the past. Solutions to these overharvesting crises will not come easily. They require a careful balance between autonomy and oversight, where national governments are

independently compelled to protect our global resources, but accountable to their international allies.







### **Market**

*Three photos from large permanent market in downtown Apia, Samoa's capital city. Scenes from the central market in Apia, Samoa.*

### **Humpback calf**

*Tourists are drawn to the northern group of Tongan islands, Vava'u, from around the world to watch and swim with humpback whales. Mothers spend months here every year rearing the calves in the shallow, warm, protected waters of Vava'u's many bays complex geography. I couldn't pass up the opportunity to be in the water only a few feet away from a pair. It was like swimming next to a school bus, with a minivan nimbly circling.*

*The practice is not uncontroversial. In fact Tonga is popular for whale swim tours not only because they are abundant, but it is one of the few places left where visitors are allowed to be so close to whales in the water. There have been accounts of mothers becoming so stressed that they leave their calves behind. To understand how the industry is operating, researchers like this Australian graduate student covertly monitor how long boats spend near whales, and if they are following the rules they have laid out for themselves.*

### **Vava'u**

*Like most of the Pacific islands, Tonga's northernmost island group Vava'u hosts most of its biodiversity under water. Still, the islands of Vava'u are lush and productive. Large spiders are everywhere! Communities there depend on local agriculture both for subsistence (casava, sweet potato) and as their primary exports (vanilla, pineapple).*

### **Vavau cemetery**

*Because of the rocky limestone nature of the Vava'u group, soil here is shallow, and the deceased are mostly buried above ground.*

### **Motulikis**

*Between crewing on two boats, I was fortunate to spend two weeks living with the Motuliki family in Vava'u. Despite their modest lifestyle the family was incredibly generous and hospitable. Lini stands proudly with the family's pigs after feeding them coconut.*

### **Apia Samoa**

*Many islanders across the Pacific, even in relatively large cities like Apia, still provide food for their families by subsistence fishing.*







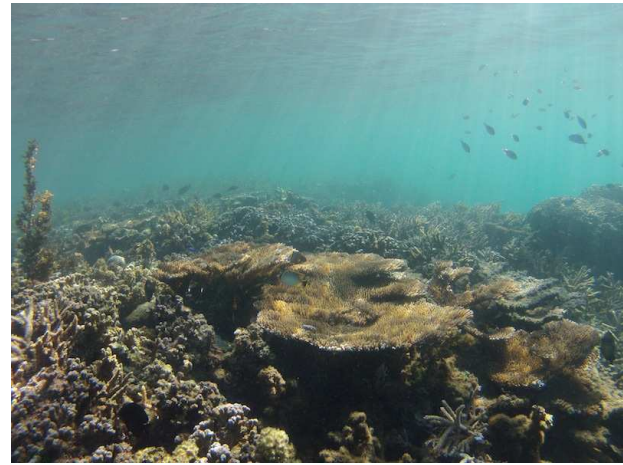












### **Horses**

*The Tongan island of 'Eua was a highlight of my experience. Much less visited than the other Tongan islands, 'Eua still contains tracts of native forest. A small herd of feral horses occupies the island's windswept southern end, which ends at a dramatic limestone cliff scoured by deep, blue ocean.*

### **Caves**

*In addition to forest, 'Eua also contained a multitude of limestone caves. I can only imagine how many caves remain unexplored there. Here my host, Wolfgang, perches himself in a favorite corner.*

### **Jellyfish**

*These jellyfish were in a large group that found themselves around the docks of the Opuia port authority in the Bay of Islands, New Zealand. I am not a jellyfish taxonomist, but this group was likely of the Cyaneidae family of true jellyfish. Perhaps a cousin to the famous lion's mane jellies, one of which is thought to be the largest animal ever recorded. The Cyaneidae are a large and far-ranging family known for their size, beauty and sting.*

### **Sea Monkey**

*The Sea Monkey, my home for three months of the trip, as seen from aloft.*

















