WILD

THINKING THROUGH SEAWATER

BLUE

MELODY JUE

MEDIA

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ELEMENTS *A series edited by Stacy Alaimo and Nicole Starosielski*

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Cover art: Giant kelp forest off the coast of Gull Island
marine protected area (Santa Cruz Island), November 2018.
Courtesy of the author.

For my dad, Rodney Jue, with love

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PREFACE / Into the Blue

If it is true that we often remember the photograph rather than the ac-
tual event, then my memory of diving in Mexico is blurred. Gliding be-
hind my dive partner in pleasantly clear water, I recall entering a ship-
wreck through a dark window and encountering a bloom of orange and
pink tunicates and anemones encrusted inside. As we drifted toward a
window, I raised my small GoPro camera toward the other diver's fins,
clicked, and then sailed through the opening behind him (plate 1). Yet
when I uploaded the pictures to my laptop much later, I was surprised to
find that the bright undersea bouquet of orange and pink had registered
as blue-green smears of light in the digital image. I struggled to recon-
cile my memory of the shipwreck with its muted signature, recognizing
the scene only by the faint outline of two crossed flippers and window
openings, surreally distorted. The photograph paled in comparison to my
memory of warm life inside, brightly ensconced in every crevice available.
Yet something about the photograph drew me—perhaps the contrast of
right angles against the soft, bumpy texture of life growing on the ship
below, or the way the flippers gently signify human presence within the
soft, greenish room.

Is there any stability of color underwater? I have looked at the wreck photo so many times now that I feel the blur of amphibious memory, shifting between the vibrant scene as my eye remembered it and the view of the GoPro camera saturated by blues and greens. Clearly the camera's eye registered light differently from mine. In fact, what the photograph preserves is the difference between my human eyes and the camera's sensor, and our varying sensitivities to ambient light at forty feet underwater. Yet light changes the deeper one goes. Explorer William Beebe famously wrote about the gradual erasure of warm colors as he descended down the water column in his Bathysphere in 1928, describing the transition from "a golden yellow world to a green one" upon plunging into the ocean.[1] At six hundred feet down, the water became a "dark, luminous blue." After seven hundred feet, "blue tapers into a nameless gray, and this finally into black," and "the sun is defeated and color has gone forever, until a human at last penetrates and flashes a yellow electric ray into what has been jet black for two billion years."[2] Here Beebe depicts the ocean as an optical medium for the experience of color, dependent on whose eyes are looking and at what depth. Perhaps blueness is not an abstract feature of the ocean, but an experience that comes into being through the particularities of embodiment and positionality.

Yet from a historical perspective, the ocean has not always been blue. The Old English word for "white"—*hwit*—was used to describe the ocean and suggests brightness or radiance. In this sense, the reflective surface of the ocean could be hwit, or the gleaming of stars. Homer's *Odyssey* repeatedly refers to the ocean as "the wine-dark sea," in part because ancient Greek—like many older languages—did not have a word for what we would today call "blue."[3] Although scientific convention stabilizes blueness to a particular wavelength (450–95 nanometers), other cultural uses of words for color are not always anchored to a specific range in the light spectrum. During a recent trip to Taiwan, I was reminded that the color *qing se* (青色) can mean blue as in blue sky (*qing tian*, 青天), green as in green pepper (*qing jiao*, 青椒), blue-green as in lichen (*qing tai*, 青苔), green as in fresh vegetables (*qing cai*, 青菜), or black as in a young person's hair; it even appears in the word for teenager (*nian qing ren*, 年青人). In these examples, *qing se* describes things exhibiting "nature's color" and the vitality of youthfulness. Seeing blue depends, then, not only on physiology but on cultural standardizations of vision.

Wild Blue Media takes its name from the common association of blue-

ness with the ocean, even though the experience of blueness above water or below is not a stable thing. Blueness has been useful in branding the emergent field of ocean humanities, or "blue humanities," which turns to the world's oceans as environments for scholarly inquiry, challenging the assumption that saving the environment means being concerned with forests.[4] Indeed, viewed from outer space, it would seem that the Earth is more blue than green. The "Blue Marble" and "Pale Blue Dot" photographs take their names from this orbital point of view, as do documentaries about the world's oceans like BBC's *The Blue Planet* and *Blue Planet II*. Oceanographer Sylvia Earle also considers blueness as a figure for the planetary in her book *The World Is Blue: How Our Fate and the Ocean's Are One*, while the name of her foundation, Mission Blue—dedicated to creating marine protected areas ("hope spots")—suggests more of a utopian pursuit of earthly care. In these examples, blue stands in metonymically for our oceanic planet seen from outer space.

Wild Blue Media intentionally signals these cultural associations while also aiming to evoke a more unsettled understanding of blue through its echo of the phrase "wild blue yonder." Although "wild blue yonder" originates in a U.S. Army Air Force song as a reference for the sky, it figuratively describes any kind of journey into the unknown or toward a limitless expanse. "Yonder" suggests that ocean media can be thought of as a horizon of possibility, just beyond our immediate experience but nonetheless part of the fabric and flesh of the world. This book shows that what we thought were the limits of media—computers, telephones, satellites, cables, movies, newspapers, radios—shift when we venture into the ocean. Further, *Wild Blue Media* explores how oceanic environments challenge some of the most ingrained and sedimented concepts in media theory: interface, inscription, and database storage. More than an account of media objects or even media processes, *Wild Blue Media* is about thinking through the ocean as an environment for thought, and accounting for the positionality of the critic along the way. Going "into the blue" means becoming aware of habits of perception that reflect the fact that we are acculturated to certain conditions of gravity rather than the buoyant and vital fluidity of the ocean, among other environmental and cultural factors.

The "wildness" of *Wild Blue Media* signals that the conditions of mediation we find in the ocean may be unruly, testing the limitations of a human point of view. Whereas wilderness was traditionally conceived as that space outside human habitation and culture, wildness can be much

closer to home. As William Cronon helpfully distinguishes, "*wild*ness (as opposed to wilderness) can be found anywhere: in the seemingly tame fields and woodlots of Massachusetts, in the cracks of a Manhattan sidewalk, even in the cells of our own bodies."[5] Wildness can crop up far away or closer to home, such as in Werner Herzog's science fantasy film *The Wild Blue Yonder*, which pretends that footage of jellyfish in the Antarctic Ocean is from an alien planet. This ironic move folds the desire for venturing into the blue unknown back into reenchantment with the Earth. Yet wildness also deals with the untamed, the out of control, the unmarked. For Jack Halberstam, wildness "skews toward collapse and works always on behalf of failure."[6] I think of the ocean as a wild milieu for testing our most habitual concepts and categories, an environment within which they might fail or break. Wildness might point to the limits of the human sensorium, or the thresholds of perceptibility. This is not to reify the ocean as an absolute other, like the sentient planetary ocean of Stanisław Lem's novel *Solaris* that repeatedly deters scientific study. It is, however, to say that we might have something to learn by testing our ways of speaking about media in the ocean.

So while the ocean has not always been blue—also hwit, also wine-dark—perhaps blue is as good as any place to start. Perhaps blue marks our initial position at the surface, oriented by the scientific metrics of the light spectrum. Perhaps blue signals a promise to engage with the oceans as distinct from terrestrial and aerial environments while recognizing their interconnection through the material flows of the weather and global capitalism. Perhaps blue illuminates an awareness of human endangerment from sea level rise alongside the ways that anthropogenic pollution, ocean acidification, and overfishing are wrecking global ocean ecosystems. Perhaps blue invites a certain humility, recognizing that culturally specific ways of speaking about the world may undergo further changes in the cold buoyancy of the water column.

Perhaps blue is just the beginning.

INTRODUCTION / Thinking through Seawater

One summer a few years ago, I stood on the sandy edge of a rock jetty in North Carolina's Outer Banks. After trudging along a quarter mile of beach with scuba gear in tow, it was a relief to enter the cool water, weightless and buoyed by the prostheses of a wet suit, tanks, and air-filled vest (BCD).[1] As I swam out to deeper water with my classmates, our instructor reminded us of strategies for descending: let all the air out of your vest, breathe normally, and pinch your nose every time you exhale to equalize your ears with the ambient water pressure. Failing to do so, he reminded us, would result in sinus pain—so we would be wise to equalize (pinch) early and often. Our lungs would form an interface with the life-sustaining technology of regulators from which to breathe, connected by hoses to the air tanks strapped to our backs. Through another pocket of mediating air (in our goggles), focused vision would be possible, though slightly magnified.[2] As we descended into the smooth liquid depths, brushed by streams of bubble exhalations, I was reminded that "breathing underwater is an unnatural act."[3]

Despite being a swimmer, I found it difficult at first to maintain a controlled, level posture while moving through the water. Seasoned divers are distinguished by their calm, horizontal glide, with arms lightly folded

across the chest to prevent any equipment from brushing the seafloor.[4] This posture comes from the familiarity of spending hours underwater and achieving neutral buoyancy (to neither rise nor sink), adjusting the air volume in one's vest as needed. Yet as a new student of the sea, I was not yet comfortable. Whenever I felt myself sinking out of control, or dangerously close to a patch of sea urchins on the rock jetty, I would immediately try to stand upright and put my flipper feet below me, braced to stop my "fall." Standing upright was clearly a habit formed from my anthropoid experience of gravity. It was as if my body still thought it was on land, falling through air rather than water, attempting to ensure a safe landing and overriding what I knew I was supposed to do. I quickly realized that becoming a good diver was going to require extensive rehabituation: I needed to rewire the reflex to stand up and get used to how the act of breathing affected my motion, slightly sinking with each exhalation and rising with each inhalation.[5] It would be some time before, as Jacques Cousteau once put it, I would experience my "flesh feeling what the fish scales know."[6]

The practice of learning to dive has directed my attention to how our instinctive postures, embodied habits, and muscle memory are all adapted to the gravitational conditions of walking on land and breathing air (amid a range of abilities). Indeed, these terrestrial habits of movement and orientation are so ingrained as to be virtually invisible, unless one experiences their interruption through a change in body state (a growth spurt, dizziness, injury) or a change in milieu (parachuting, swimming, diving).[7] Although many people around the world grow up intimately with the oceans—through swimming, freediving, sailing, fishing, surfing—there are, as of yet, no biologically amphibious humans; the demand to "surface" is an orientational constraint for all human beings that, as I show in this book, has specific impacts on language and figurative speech.[8] If one agrees with Ludwig Wittgenstein's observation that to imagine a language is to imagine a form of life, then it is clear that human languages have taken form within a range of terrestrial and coastal environments that, at minimum, all share the experience of gravity and horizontal (rather than volumetric) movement.[9]

By sinking deeply into the ocean in *Wild Blue Media*, I aim to show how the ocean is just the beginning of developing a broader sensitivity to the role of milieu in the fields of media studies, literary studies, science and technology studies, and the environmental humanities. I see

the ocean as a vital starting place to develop what I call *milieu-specific analysis*, calling attention to the differences between perceptual environments and how we think within and through them as embodied observers. By offering entirely different conditions than land—increased pressure, three-dimensional movement, light refraction and magnification, and the inability to tell the direction of sounds, to name a few—the ocean is a material and imaginative space for the conditions of perception that we have taken for granted. Milieu-specific analysis acknowledges that specific thought forms emerge in relation to different environments, and that these environments are significant for how we form questions about the world, and how we imagine communication within it. However, the challenge with milieu-specific analysis is not to reify the ocean as a stable object, since what the ocean "is" is also a matter of "for whom." There should also be a historical consideration, since the way we come to know the ocean is through many accumulated moments of contact through our bodies, cultural practices, and technological instruments. Thus, instead of seeing the ocean as a decodable structure that determines thought, we can think of it as a dynamic milieu whose characteristics manifest by actively moving within it (as a human, octopus, plankton, or other) and through mediated forms of contact.[10]

The importance of mediation here is key: in order to study the ocean—especially the deep ocean—scientists need a variety of instrumentation, satellites, remotely operated vehicles (ROVs), submersibles, sonar, and other technical prostheses for sampling and sensing.[11] Early oceanographers like Marie Tharp built up entire maps of the seafloor from the data of sonar pings, revealing a textured landscape of the deep that no one had quite anticipated.[12] Today, computer technologies perform the work of signal transduction, converting acoustic measurements into visual renderings.[13] Rather than being immediately present to us, the (deep) ocean emerges as an object of knowledge only through chains of mediation and remote sensing—measurements that allow us to build up imaginative pictures of what life in the ocean is like, often from points of view that would be physically impossible to inhabit without the protection of a submersible.[14] As Rachel Carson wrote, "To sense this world of waters known to the creatures of the sea we must shed our human perceptions of length and breadth and time and place," either imaginatively or with the help of remote-sensing visual technologies.[15] Her "underwater traveler" pictures conditions in the depths of the ocean that include "enormous pressures" and "glacial cold,"

nonvisual sensory elements learned about from the mediation of remote technological devices.[16]

Attending carefully to the conditions of mediation—or how we come to know about distant and expansive ocean ecologies—is not only a speculative act but also of vital significance for environmental activism and environmental justice today. Consider the Deepwater Horizon "spillcam" feed: when the oil rig blew up in 2010, the public demanded that camera footage at the base of the oil well be made public.[17] For weeks on end, one could tune into a 24/7 live feed of oil gushing forth from the broken well, lending an eerie immediacy to an event that everyone could only experience at a distance. Yet as Susan Schuppli writes, the footage was political not only as a form of virtually witnessing the disaster but because scientists with an understanding of fluid mechanics used the footage to calculate the actual number of gallons per day leaking forth—a number much higher than BP's own estimate.[18] Such calculations were key in the lawsuits that followed, providing a baseline for estimating ecological injury. However, the importance of spillcam as a witness should not overshadow the fact that media themselves have considerable energy demands, depending on the very infrastructure of extraction that they sought to document in its spectacular failure; media contribute to petroculture even as they document it. The field of environmental media studies tackles such contradictions, balancing a consideration of media representations, media infrastructures, and media materiality.[19]

While other threads in environmental media studies also seek to articulate the ocean *as* a medium (a point I address later in this introduction), *Wild Blue Media* argues that our preexisting conceptions of media and mediation need to undergo recalibration in the milieu of the ocean. Media theory has been using a conceptual vocabulary that derives its sensibility from terrestrial and anthropocentric contexts, and then deploys this same vocabulary to describe mediation in the ocean. If we have grown used to talking about networks, information, data storage, recording, transmission, inscription, and interfaces in relation to computer technologies, to what extent do these terms adequately address processes of mediation in the ocean? In order to gain perspective on the terrestrial biases of concepts in media theory, *Wild Blue Media* develops a methodology of *conceptual displacement*. This science fictional strategy involves imaginatively submerging media terms into the ocean to see how they hold up in a liquid milieu

of pressure, salinity, and coldness (among other qualities). Methodologically, each of the first three chapters of this book submerges a different term—interface, inscription, and database—in order to see how our understanding of them necessarily shifts under the ocean. Such a task requires a form of amphibious scholarship that remains attentive to the milieu specificities of ocean environments (be they shallow, pelagic, or deep) and the critic's own norms—keeping track of surprising contexts for the use of concepts, or where they acquire new valences. Chapter 4 brings these new oceanic valences of interface, inscription, and database to bear on the complex dynamics of mediation in underwater museums, developing an amphibious perspective through my own practice of scuba diving.

However, the process of developing an amphibious perspective through oceanic immersion has its constraints. After all, preparing to dive involves an exchange of terrestrial immobility for aquatic mobility. Imagine struggling into a thick wet suit on the surface of a rocking boat, strapping on a heavy weight belt and tank, a set of awkward fins, and, finally, a large mask. Sweating all the way, often steadied by a crewmember, you rejoice when you finally plunge into the cool relief of the water, your weight buoyed by the ocean. Finally, you are in the element in which your prosthetically augmented body moves best, and you may even forget that you are wearing equipment at all. The diving equipment "comes into being with the seascape," as Stephanie Merchant writes, and what was once heavy and uncomfortable goes unnoticed in its functionality—that is, unless your mask fogs, or your skin chills too much, or your ears hurt from the pressure.[20] You are suspended between remembering and forgetting the equipment that enables aquatic immersion in the first place. At the threshold between ocean and air, there is no universal condition of perfect adaptation. However, we can investigate "the physical and the conceptual in/accessibility of [specific] environments," as Stacy Alaimo names one possible intersection between disability studies, crip theory, and environmental humanities.[21] This accessibility is always a question of technical mediation, facilitated through simple and complex technologies—from wearing goggles with their vision-enabling pocket of air, to sonar systems of mapping.[22] Recognizing how difficult it is to escape the gravitational pull of the Earth, the utopian and science fictional impulse of this book is to explore the ocean as a force for conceptual reorientations that sometimes estranges what we thought was familiar. By bringing you,

reader, into the oceanic depths, I aim to take you out of immersion from the habits of thought cultivated at your desk.

Conceptual Displacement as Science Fictional Strategy

In "Orientations Matter," Sara Ahmed writes that philosophy is full of tables—the object most at hand for sedentary philosophers, contemplating indoors. Tables function as "orientation devices": the repeated act of working at a table, as anyone reading this is well aware, often leads to slumped shoulders, achy backs, neck problems, and joint pain: "Our body takes the shape of this repetition; *we get stuck in certain alignments as an effect of this work*."[23] For Ahmed, bodies "acquire orientation" through the repetition of certain actions, actions that coalesce around objects like tables and other sites of labor (or the ground we walk or roll on).[24] In his writings about the weather, Tim Ingold also questions how the physical location of the office has impacted scholarship: "Perhaps it is because we generally think and write indoors that we have such difficulty in imagining how any world we inhabit could be other than a furnished room, or how, cast out from this interior space, we could be anything other than exhabitants."[25] If writers, artists, and theorists have traditionally been situated at a table in front of a computer to reflect on representations of the ocean from a distance, what form of thought might take place from within the water column, pressed on all sides by the fluid salinity of seawater? To what extent might the ocean operate as a necessary "disorientation device" for theory and philosophy, a milieu that denatures our normative habits of orienting to the (terrestrial) world through language?

Drawing on the experience of sensory estrangement when I first learned how to dive, *Wild Blue Media* develops conceptual displacement as a method of defamiliarization to make our terrestrial orientations visible. This science fictional method of thinking with the ocean productively estranges the terrestrially inflected ways of theorizing and thinking to which we have become habituated. Thinking with the ocean involves asking *How would ways of speaking about (x) change if you were to displace or transport it to a different environmental context, like the ocean?* Even in this, one must be specific about which part of the ocean—littoral, pelagic, benthic—is involved in the displacement and its cultural histories, but the important thing is to think through the affordances of whichever oceanic environment one

specifies.[26] Like divers who want to "stand up" when they feel out of control underwater, conceptual displacement is about recognizing what terrestrial habits we carry with us through the act of imagining familiar concepts underwater, displaced from the normal scene of humanities writing. The ocean is a kind of anti-environment to the desk, repositioning critics in the ocean in order to prompt them to rethink the efficacy of their most habitual concepts and vocabularies (plate 2).[27]

As I explain in this book, the displacement of concepts in the ocean can show how our uses of metaphor and figurative language—the ways we habitually speak—fall within a milieu-specific, or surface-specific, way of talking about the world. Even when we believe we are speaking literally, the way that we ordinarily speak draws on subconscious uses of metaphor.[28] Conceptual displacement works by amphibiously holding the tension between the milieu specificity of the ocean with the milieu specificity of the observer's normative environment, to the best of one's estimation. In this way, conceptual displacement is rigorously self-reflexive, attending to the ways that theorists and writers draw on their normative habits of orientation within a particular environment. This relationship between habit and habitat is key, as both share an etymological root word (Latin: *habitāre*) that has to do with dwelling. I see conceptual displacement as a method of dislocating terrestrially nurtured thought into the ocean, a process that may involve physical immersion, technically mediated immersion, and speculative immersion through fiction, film, digital media, and the arts.

Conceptual displacement as methodology has strong ties with the genre of science fiction. Writer Philip K. Dick once defined science fiction as a genre predicated on a certain "conceptual *dislocation*," or estrangement from one's familiar experience. In good science fiction, "the conceptual dislocation—the new idea, in other words—must be truly new (or a new variation on an old one) and it must be intellectually stimulating to the reader; it must invade his mind and wake it up to the possibility of something he had not up to then thought of."[29] This resonates with Darko Suvin's classic definition of science fiction as the genre of cognitive estrangement, imagining a world that is logically continuous with what we know about reality while introducing something new that defamiliarizes the present. For Suvin, good science fiction necessarily exhibits a "cognitive" function (plausibility within scientific knowledge of the universe) and "estrangement" provided by the strange newness of a "novum," a new

thing, invention, or set of circumstances.[30] In *Wild Blue Media*, the ocean provides an estrangement effect on terrestrial conceptions of media and mediation, providing a new set of environmental circumstances under which to consider their efficacy.

Of course, many science fictions have imagined the ocean—or extraterrestrial oceans—as dramatic spaces harboring unforeseen forms of alien life and ecologies. Jules Verne's classic novel *20,000 Leagues under the Sea* is perhaps the most famous nineteenth-century text to take readers imaginatively into the ocean in *The Nautilus* submersible, describing marine life and a monstrous kraken. Stanisław Lem's *Solaris* imagines a sentient ocean planet that frustrates human efforts to understand it, while feminist science fictions like Joan Slonzcewski's *A Door into Ocean* and Nnedi Okorafor's *Lagoon* focus more on alien biological diversity in the ocean (and in Okorafor's case, an Afrofuturist vision for breaking dependency on petroleum).[31] However, *Wild Blue Media* is not only about the genre of published ocean science fiction as such. By seeing the ocean as a milieu capable of providing estrangement effects, this book employs an expansive notion of science fiction as a genre that includes cultural discourse in nonbook and nonfilmic forms.

Stefan Helmreich's pathbreaking study *Alien Ocean: Anthropological Voyages in Microbial Seas* offers one way of seeing science fictionality beyond published novels and films, through its identification of the "alien ocean" as a common trope that emerges across a variety of cultural contexts, including microbiology, documentary film, and aquarium exhibits. For example, David Attenborough's narration of the deep sea in *Blue Planet* documentaries becomes science fictional when he notes that "more people have been to outer space than to the bottom of the deep ocean," an environment that is home to "alien" life forms that live there in a milieu of pressure and darkness.[32] Aquarium exhibits also evoke the strangeness of "alien" sea creatures, drawing parallels between science fictional imaginations of the cosmos and the deep ocean. For Helmreich, the alien ocean is not a reification of the ocean as always alien and science fictional; rather, the alien ocean is a specific cultural construction that one can identify in many places that include, but are not limited to, ocean science fiction. What this implies is an understanding of genre as a mobile lens of interpretation that can describe phenomena not normally under the purview of literary study. I see similarities between Helmreich and scholars such as Lisa Yaszek and Lindsey Thomas, who show how public policy writing

and emergency preparedness plans—documents that require writers to speculate ten, fifty, or one hundred years or more in advance—can also act as science fictions.[33] For me, what makes the ocean science fictional is not an ontological connection between space aliens and sea creatures but rather the effect of cognitive estrangement underwater, of shocking the reader out of their normative habits of thinking and speaking about the world that belie our terrestrial acculturation. It is from this expansive understanding of genre that I think of the ocean as a natural environment for science fiction, estranging our terrestrial perspectives on space, life, and normativity in relation to the specificity of seawater—a locus for situated knowledge.

Situated Knowledge and Objectivity

In *Wild Blue Media* I approach terrestrial bias not as a flaw but as a form of what Donna Haraway calls "situated knowledge." In the mythology of objectivity, objectivity aspires to a form of disembodied, disinterested, critical distance—a point of view Haraway calls the "God trick," or view from nowhere. Rather than throwing out objectivity all together, Haraway instead advocates for a new understanding of what it means to be objective, marked by the "engaged, accountable positioning" that takes into consideration who wants to ask particular questions in science, and why we decide they are worth funding.[34] From this framework, scientific facts about the world do not simply exist in some universal repository—scientific facts about the world are established *for* particular human communities through particular measuring instruments, sensing technologies, and cooperation. Indeed, scientific questions and their funding—especially gender, race, and genetics—may reflect the assumptions and values of one community but not others. To situate knowledge is to address the "radical historical specificity, and thus contestability, of every layer of the onion of scientific and technical constructions."[35] In a move toward epistemic humility, Haraway finds value in the "partial perspective," an acknowledgment of the conditions of possibility from which a point of view emerges.

Haraway's call for situated knowledge participates in a broader critique of the myth of objectivity by scholars in feminist science studies. The term *feminist* in feminist science studies includes more than advocating for more women in STEM fields, formulating research questions per-

tinent to women's lives, and critiquing normative gender roles. *Feminist* also means directing and challenging the idea that there is one universal perspective shared by all. In this way, situated knowledge draws on earlier articulations of "standpoint theory" by Dorothy Smith, Sandra Harding, and Patricia Hill Collins, which consider how differences in power, interest, and situation relate to the questions one might ask, or features of the world that may be most relevant to those asking.[36] In Smith's words, "From the point of view of 'women's place' the values assigned to different aspects of the world are changed," a point that Collins complicates by adding the dimensions of race and class.[37] However, qualifying one's standpoint is not always an easy matter of laying out intersectional filiations—sometimes elements of one's standpoint are more subtle, invisible, or taken for granted. As Haraway cautions, "Location is the always partial, always finite, always fraught play of foreground and background, text and context, that constitutes critical inquiry. Above all, location is not self-evident or transparent."[38]

If one unacknowledged standard of objectivity has been a human being standing on the ground, then oceanic organisms offer quite different perspectives, having adapted to the physical conditions of the ocean in ways that differ profoundly from those on land. For example, mantis shrimp have sixteen types of light-sensing cones in their eyes (rather than the three that human beings possess), attuning them to a much broader range of the electromagnetic spectrum. Many other sea creatures rely on hearing (like whales) and/or sense of smell (like sharks). Furthermore, to us, other sea creatures would seem to possess modes of synesthesia that combine at least two of "our" senses. Octopuses can taste with their tentacles, as Sy Montgomery beautifully relates in *The Soul of an Octopus*, and so can some crustaceans. The range of perceptual capacities of ocean organisms—that we learn about through scientific instrumentation and sensing devices—should humble us into considering how our own sensory attunements are a very narrow band through which parts of the world might be perceived.

I imagine "terrestrial bias" as a necessary partial perspective—one that, once recognized, erodes the dream of a master language that would be totally objective, distant, and adequate to articulating and describing the world in its entirety. The milieu of the ocean offers an epistemological check on human knowledge formation, presenting entirely different conditions for perception, sensation, and life than terrestrial environments.

My theorization of milieu-specific analysis asks that we consider the observer's milieu in addition to the role of culture, class, gender, race, ability, and other identitarian categories and how the observer's orientations within a particular (terrestrial) milieu relate to the ways that they speak about the world and orient to the world through language. Knowledge developed in terrestrial environs—of which there is, of course, much cultural and historical variation—is situated knowledge, as is knowledge situated in the depths of the ocean. Thus, rather than thinking of the terrestrial bias in media theory as synonymous to something false or incorrect, I would like to think of it as a situated perspective that responds to the fact that we live on land, are bound by gravity when we walk, and experience daily life as immersion in invisible air rather than water.

Terrestrial Bias and Milieu-Specific Analysis

To get a sense of the extent to which living on the Earth orients our thought, think of all the ordinary ways of speaking about the "ground": they are a well-grounded individual, they have no grounds to make that claim, their expertise is grounded by many years of fieldwork. In each of these formulations, "ground" appears as the equivalent of stability or evidence. As a result, "ground" creeps into our metaphorical ways of talking about validating points of view or arguments. Take, for example, the way David Abram describes the importance of the environment for cognition in *The Spell of the Sensuous*:

> Thus, the living world—this ambiguous realm that we experience in anger and joy, in grief and in love—is both the soil in which all our sciences are rooted and the rich humus into which their results ultimately return, whether as nutrients or as poisons. Our spontaneous experience of the world, charged with subjective, emotional, and intuitive content, remains the vital and dark ground of all our objectivity. And yet this ground goes largely unnoticed or unacknowledged in scientific culture.[39]

Here, Abram's metaphors for being in touch with the living world all relate to the contact zone of "soil" that our sciences are "rooted" in, the "rich humus" and "dark ground" as the condition for "all our objectivity." Abram goes on to discuss the work of phenomenologist Edmund Husserl and his

argument that the Earth "provides the most immediate, bodily awareness of space, from which all later *conceptions* of space are derived."[40] Thus, "*all* bodies (including our own) are first located relative to the ground of the earth, whereas the earth itself is not 'in' space, since it is the earth that, from the first, *provides* space."[41] In philosophy and beyond, it is the Earth's surface under an atmosphere that has been taken as the default environment for human thought, and the foundation of intuition about spatiality.

I see these figurations of "ground" not as wrong or falsifiable, but as a common way of developing a picture of reality through an environmental imagination situated terrestrially. I agree with Abram (and Husserl) that in Western culture, the phenomenological experience of space was learned on the still Earth. However, I disagree that this is the whole picture; we should not mistake the grounding of human thought, reason, and intuition on the Earth as objectivity itself, or as the most neutral way of cognizing the world. Terrestrial contexts are but one milieu for cognition to press up against; thought might develop entirely differently in an aquatic environment like the ocean. As a Californian used to earthquakes, I am, of course, aware that the ground is a dynamic and fluid medium across geologic time scales, but I maintain that the ground commonly figures as a foundation for knowledge, or as a locus of stability in the duration of a human life.

As another example of terrestrial bias, consider how Pierre Bourdieu's concept of the habitus uses the reference point of the ground. In Bourdieu's original formulation, the habitus is "embodied history, internalized as a second nature and so forgotten as history."[42] It is both the product and producer of a set of individual and collective practices that shape particular "schemes of perception, thought and action," as well as what is taken for granted, "procedures to follow, paths to take."[43] The habitus, a product of history, "ensures the active presence of past experiences, which, deposited in each organism in the form of schemes of perception, thought and action, tend to guarantee the 'correctness' of practices and their constancy over time."[44] Like silt that gathers at the bottom of a river, or a kind of sediment, the habitus—which suggests both habit and habitat—is figured as a kind of accumulation of earthy history. If our experience dwelling on the surface of the Earth (or at least the surface of a boat) contributes to this past, sedimented in our very schemes of perception, then

habitus brings us to a greater consideration of the ways that a terrestrial bias informs conceptual formation in philosophy and theory.

I bring up the terrestrial bias in Abram's and Bourdieu's work as two examples that stand for a broader trend in critical theory and academic writing that takes, as its normative starting point, an observer at the surface of the Earth that is its own form of situated knowledge. This book could have been written as a survey of works in Western philosophy and criticism that most exemplify a terrestrial bias (and such a project has still to be written).[45] However, I feel that it is more constructive and more expansive to develop a theory of milieu specificity that addresses the situated nature of all knowledge production for specific observers. Objectivity is to be found not in a universal perspective (what Haraway calls the "view from nowhere") but in the particularities of embodied knowledge in milieu-specific conditions that stretch us to think through the ocean—or the sky, high-altitude mountains, or low-gravity environments such as the moon and Mars.

Milieu-specific analysis figures as a general conscientiousness of the environmental conditions in which scholars produce theories. As I develop it here, milieu is not simply the climate of a critical text, or a general influence, but constitutes something that the theorist actively orients within, through language. Attending to milieu—a word with a rich history ranging from mechanics to biology that, in Georges Canguilhem's usage, alternates between being "a centered space" or "mi-*lieu* [mid-*place*]," and a "decentered space" (intermediary field) or "*mi*-lieu [*mid*-place]"—stresses the tension between the observer and the environs they think from.[46] Thus, one of the requirements for the study of the ocean as an epistemic environment for thought is to attend not only to the material specificities of the ocean but also to the particular observer/perceiver who is interacting with the ocean.

Milieu-specific analysis differs from earlier writings on "medium specificity" in the fields of art history and media theory through its particular invocation of the environment, although both attend to materiality. Marshall McLuhan's famous statement "the medium is the message" in *Understanding Media* looked to the importance of physical form in relation to symbolic content. "The electric light is pure information," he wrote. "It is a medium without a message, as it were, unless it is used to spell out some verbal ad or name. This fact, characteristic of all media, is that the 'con-

tent' of any medium is always another medium."[47] Thus, the "message" of
a medium is the "change of scale or pace or pattern that it introduces into
human affairs."[48] John Guillory traces a longer history of the concept of
medium going back to Aristotle, while noting, "The emergence of the me-
dia concept in the later nineteenth century was a response to the prolif-
eration of new technical media—such as the telegraph and phonograph—
that could not be assimilated to the older system of the arts."[49] In the
1950s, art historian Clement Greenberg defined "medium specificity" as
the critical attention to the substance or material of an artwork, particu-
larly in Modernist painting.[50] Whereas Greenberg's medium specificity
focused on the object itself, Katherine Hayles's "medium-specific analy-
sis" in the early twenty-first century emerged from her call to develop
vocabulary specific to the materiality of media technologies while not
isolating them as objects.[51] Critical of the poststructuralist tendency of
the late twentieth century to use the vocabulary of text to describe any-
thing and everything, Hayles argues that the vocabulary of "text" based
on the printed page is inadequate to address the materiality of media. As
an alternative, her medium-specific analysis attends to the specificities of
form while also being aware of how different media may cite or imitate
one another. The implications for the study of oceanic milieu specificity
should be clear: just as it was a problem for the vocabulary of textual anal-
ysis alone to describe and analyze media, it is also a problem for terrestrial
analytics to describe mediation in all its forms. Through the act of imag-
ining media studies underwater, we can become more aware of the calci-
fied habits of our (theoretical) storytelling, and their predilections for the
solid, the fixed, the reliable, the static.[52] Milieu-specific analysis poses the
following question: *In what environmental milieu do scholars write their theory,
and to what extent does it inform their thinking and writing?*

Although *Wild Blue Media* focuses on the ocean, milieu-specific analy-
sis is a form of attention that is equally at home considering the particu-
larities of swamps, glaciers, atolls, grassy plains, cityscapes, and more, ex-
tending the purview of the environmental humanities to more than just
green or forested environments. Essay collections like *Prismatic Ecology:
Ecotheory beyond Green* offer a way to begin thinking milieu specifically,
resisting the "green branding" of environmentalisms in favor of a broader
spectrum (pink, gold, violet-black, and more) of color-based iconography.[53]
One might also find a hint of milieu specificity in ethnomusicologist Ste-
ven Feld's theorization of rainforest "acoustemologies" specific to lush

canopy environments, Barry Lopez's observation that the extreme alternation of seasons characterizes the Arctic environment, or David Valentine's discussion of gravitational differences on future Martian colonies or space stations.[54] Because milieu specificity opens to the particularities of any milieu, it need not rest on the dialectic tension between ocean and land alone but in the saturated push and pull of what Kamau Brathwaite calls "tidalectic" relation.[55] Concerning the messiness of environmental boundaries, Tim Ingold observes, "Rainfall can turn a ploughed field into a sea of mud, frost can shatter solid rocks, lightning can ignite forest fires on land parched by summer heat, and the wind can whip sand into dunes, snow into drifts, and the water of lakes and oceans into waves."[56] In what Ingold calls the "weather-world," elements co-saturate each other, making clear distinctions between environs but a dream of purification.[57] Perhaps in another way, the Earth and more specifically its oceans are saturated by human agency. Oil extraction directly contributes to global climate change, ocean acidification, sea level rise, and coral bleaching, while new industrial-scale fishing methods have led to the collapse of many fisheries stocks.

Indeed, it is impossible to do responsible work about the ocean today without addressing anthropogenic effects—a tension exhibited by BBC's *Blue Planet II* documentary series, which concludes nearly every episode with a self-awareness of anthropogenic changes in the ocean. Considering BBC's long history of making nature films absent of humans, its shift to include human influence is both heartening and a grim sign of the state of the ocean today, relative to historic baselines. Yet such sea changes affect not only marine life but human communities as well. Sea level rise and regional collapses of fishing stocks have been affecting vulnerable coastal and island communities on an incremental scale, enacting a form of what Rob Nixon calls "slow violence" rather than the more spectacular violence of something like an oil rig explosion.[58] As an instance of slow violence, the encroachment of sea level rise leads to "displacement in place" of climate refugees, Nixon's formulation for the way that people may face dislocation without having moved at all.[59]

The imaginative strategy of conceptual displacement that I articulate in *Wild Blue Media* is shadowed by these literal oceanic displacements of people and living beings, displacements that are projected to accelerate dramatically in the next century. Chapter 1 concludes with a discussion of submergence as a strategy of climate change protest, focusing on the

example of the Maldives' underwater cabinet meeting in 2009. Chapter 2 demonstrates this tension between human displacement and speculative displacement, engaging Vilém Flusser's writings on migrancy alongside his media fable about the vampire squid. Chapter 4 offers another view, considering what it means to think about submerged history through the example of Jason deCaires Taylor's underwater museum and its visual relation to Middle Passage history. By demonstrating how to *think through* seawater rather than take the ocean as a discrete object of analysis, this book hopes to inspire new tactics of artistic and political resistance against climate change in both its global and local effects.

The Ocean Humanities

The method of "milieu-specific analysis" not only calls attention to the terrestrial bias of critical theory but also changes the practice of scholarship in the emerging field of ocean humanities. The ocean humanities—also sometimes called the "blue humanities" or "thalassography"—distinguishes interdisciplinary work on the ocean from the broader umbrella of environmental humanities.[60] Distinct from green forest spaces, the ocean figures as a vital confluence of overlapping theoretical approaches that deal with global climate change, indigenous cultural histories of seafaring and navigation, shipping routes and global capitalism, the alterity of marine organisms, the Middle Passage, technologies of ocean mapping and remote sensing, marine resource extraction, maritime literatures, and more.[61] Such topics usually require expertise from more than one field—for example, geography and history, literature and media—giving rise to a number of interstitial scholars who loosely identify under the umbrella of the ocean humanities.

However, milieu-specific analysis differs from previous work in the ocean humanities by engaging with the ocean as an environment for thought rather than as an object of analysis or region for the study of cultural representations. By dwelling with the epistemological implications of thinking through the ocean, this book calls on critics to track their own areas of terrestrial bias, even within their studies and theorizations of the ocean. One of the closest articulations of thinking "through" the ocean comes from Stefan Helmreich in his generative conclusion to *Sounding the Limits of Life,* where he discusses the ocean as "a medium

through which living and knowing happens." What Helmreich calls "theory underwater" implies "not merely theorizing underwater things, but subjecting theory to unfamiliar conditions as well—of pressure, saturation, waterlogging—seeing how it deforms as it merges with what it seeks to describe."[62] What is key about this formulation is the feedback loop between knower and known, human and ocean. "Subjecting" (or better, submerging) theory underwater, or what I call "conceptual displacement," is precisely about tracking the deformations of what we thought we knew through the unique materiality and physical conditions of the ocean. For example, in chapter 1 I take a special interest in the role of "pressure" as an environmental factor that literary readings and media analyses have often ignored, in part because pressure is not easily represented in visual terms. Pressure is what helps me read "interface" as a distributed and volumetric phenomenon rather than solely a matter of surface.

Indeed, one of the key areas where *Wild Blue Media* differs from existing studies of oceanic literature is through its focus on interpretation within the depths rather than at the surface, which is most common in studies of seafaring literature.[63] Although the surface of the sea can also produce sensory estrangement—which I know all too well from my own experiences of seasickness—this book privileges vantage points from within the water column, and texts that dwell with the challenges of narration from this point of view. By focusing on interpretation from within the water column, I provide an alternative to the unacknowledged spatial configuration that has informed literary interpretation for quite some time: the idea that the interpreter is located on the surface of things. From the surface, the interpreter either plumbs the hidden depths of the text (as in the hermeneutics of suspicion) or considers other "surface" or topographic features of a text (as in the varieties of "surface" reading outlined in Stephen Best and Sharon Marcus's issue of *Representations* in 2009).[64] In chapter 1, I discuss the implications of moving the critic into the water column through my own immersed readings of oceanic science fiction and ocean memoir that engage with this positionality. *Wild Blue Media* calls on the ocean humanities not only to consider representations of ocean environments in literature and media but also to attend to the ocean as an *environment of interpretation*.

Another challenge in the ocean humanities has been to develop a critical vocabulary specific to the ocean, in spite of a tendency toward terrestrial mimesis.[65] For example, literary scholar Ian Baucom writes that

a hydrographic imaginary in literary studies serves not only to "trouble or reorganize" but also to "multiply our maps of the 'real,' to render visible some additional fraction of all those worlds virtually present within the world. . . . What we know of the world depends not simply on what 'exists' but on where we stand."[66] By directing our attention to "the place where we stand," Baucom acknowledges the terrestrial position of most literary critics. Yet even the term *hydrographic* emulates the geographic; "thalassography" (sea writing) parallels geography (Earth writing); Gary Kroll's "ocean ethic" echoes Aldo Leopold's land ethic; "seascape" derives from landscape.[67] Many of the neologisms developed to address the ocean environment—like hydrography, or seascape—are modified versions of terms that we use to talk about the land. There is truth to Dan Brayton's claim that the "deep encoding [of the land] in the terminology and conceptual categories that define ecocritical inquiry profoundly limits our object of study and keeps us from reaching beneath the surface of what Mary Oliver calls the 'green and black cobbled coat' of the sea," but even this poetic image relies on an anthropomorphic reference (the cobbled coat) to describe the ocean in human terms.[68]

Wild Blue Media does not simply create a new critical vocabulary specific to oceanic conditions, mapping out a new terrain for neologisms or "wet theory."[69] Instead, it foregrounds the methodology of conceptual displacement as a means for gaining perspective on habits of description, interpretation, theoretical orientations, and assumptions about environmental context. I aim to leave the critic somewhat at sea, unsettled from their habituated ways of speaking about the world. *Wild Blue Media* not only shifts critical inquiry to the site of oceans but more importantly asks scholars to reflect on the invisibilized environment or milieu that they think within as well as on how this grounding has informed the way that they have (up till now) deployed concepts and categories and even used prepositions (as I discuss in chapter 2).

My focus on the ocean as a science fictional medium of estrangement may seem to be at odds with the focus on kinship and connectivity in postcolonial studies of ocean literature, but I actually see them as complementary projects with the common goal of rethinking norms in Western thought. Many indigenous-focused spatial studies theorize the active formation of feelings of kinship with oceanic regions and cultural heritages, which, to a certain extent, functions as a reenchantment process. This tactic of reenchantment with more-than-human ecologies has the

effect of making apparent the habits of thought that inhere in Western philosophy in contrast to alter/native epistemologies. As a polysemic milieu, the ocean can of course support both indigenous characterizations of the ocean as a familiar home and science fictional characterizations of the ocean as a space of alterity. This book is in companionable conversation with indigenous perspectives on the ocean like Karin Ingersoll's *Waves of Knowing*, with the mutual goal of denaturalizing Western habits of thought and perception.[70]

In thinking through the element of seawater, *Wild Blue Media* draws on a genealogy of elemental philosophy. Gaston Bachelard's *Water and Dreams: An Essay on the Material Imagination of Matter* carefully delineates how water offers "its own rules and poetics" that often evoke the womb, the unconscious, drowning and death. Bachelard writes of how "a being dedicated to water is a being in flux. He dies every minute; something of his substance is constantly falling away," a figure that recurs throughout literary imaginations of undersea bodies.[71] Feminist theorists have also taken an interest in the element of water in relation to feminine alterity, or in water's "gestational" properties that do not fall under the frame of a sexual binary.[72] This vital materiality of water as a medium of becoming changes how we might think about conditions of storage. Chapter 3 takes this up specifically to consider the difference between representations and renderings of seawater in digital media, and the materiality of seawater itself. By tracking what aspects of seawater's materiality are foregrounded or elided, I show how the ocean makes possible a different notion of storage than do digital technologies.

Seawater also changes how we think about the porosity of embodiment, a question I address in chapter 1, on theories of the interface in relation to the human lung. By focusing on the physiology of breathing underwater, I show how the interface is not only a boundary or surface but can also extend through membranes to have volumetric effects. This transcorporeal understanding draws on feminist theories of posthumanism by Stacy Alaimo and Astrida Neimanis that consider bodies not as isolated containers but as porous to distributed material flows that connect to global elements. Alaimo's theory of "transcorporeality" describes the human as "substantially and perpetually interconnected with the flows of substances and the agencies of environments."[73] Such a perspective sees embodiment in terms of buoyancy, "a sense that the human is held, but not held up, by invisible genealogies and a maelstrom of often imperceptible

substances that disclose connections between humans and the sea."[74] For Alaimo, these substances may include vital elements like water as well as poisons like mercury, where transcorporeal interconnection might indicate sustenance or vulnerability. Building on Alaimo's work and theories of phenomenology in *Bodies of Water: Posthuman Feminist Phenomenology*, Neimanis argues that Enlightenment conceptions of human beings that have become intuitive—as bounded, autonomous, individual, discrete— have done the particular damage of obscuring a different material reality that has been with us all along: our existence as bodies of water. By rewriting water back into the picture, Neimanis aims to present a more faithful account of subjectivity that—because of its distributed nature—should more appropriately be called "posthuman." The posthuman subject that emerges from these watery feminist materialisms should change our self-conception, encouraging us to see our own distributed embodiment as a condition that is attached to the ecological welfare of a sphere larger than our own body. Channeling this work, *Wild Blue Media* also keys in to the ways that images of bodies underwater resonate differently depending on specific geographies, cultural histories, and race.[75] Chapter 4 on "Underwater Museums" shows how images of bodies underwater should not evoke pure wonderment alone but also the hauntings of the Middle Passage, the refugee crisis in the Mediterranean, and other traumatic geopolitical events.[76]

Where *Wild Blue Media* differs from new materialist methodologies is through its comparative focus. Rather than tracking the flows of materials, it focuses on the relationship (and tension) between the interpreter's normative environment of interpretation and the ocean as an environment of interpretation. Perhaps the best demonstration of this occurs in chapter 2, on vampire squid media, where I show how Vilém Flusser's *Vampyroteuthis Infernalis* operates as both a speculative fiction about media in the ocean and as a fable about photography. Here, Flusser realistically images how the vampire squid would use ink clouds and skin paintings as its own liquid communication media in the deep sea. However, he allows moments to break through where he wonders how vampyroteuthic our own society might become through new imaging techniques, never losing track of the fact that it is a human observer framing all observations about the vampire squid. The comparison of vampire squid epistemology in the abyss and human epistemology on land functions as a mode of self-critique, qualifying the very text that we read with the knowledge that it

could have been written under different environmental conditions. The methods of milieu-specific analysis and conceptual displacement that I outline in this book concern such epistemological questions that are essentially comparative in nature, studying the contrast between the observer's own norms and those in the ocean.

A Sea Change in Media Studies

Milieu-specific analysis is a mode of media studies and literary criticism that involves close attention to the conditions of perception in a given environment, and to the techniques of mediation possible within that environment. What are the affordances of mediation in the ocean, for which particular observer, and through what narrative techniques is this communicated? To make this speculation, however, requires prior scientific knowledge about the ocean through techniques of remote sensing. Rachel Carson wrote that although we can no longer live in the ocean like our aquatic ancestors, we can still "re-enter it mentally and imaginatively," inventing "mechanical eyes and ears that could re-create for his senses a world long lost, but a world that, in the deepest part of his subconscious mind, he had never wholly forgotten."[77] For Carson—who never learned to dive—narrative was her prosthetic technology, her way of imagining deep ocean processes and their role in the history of the Earth and the origins of life. However, the "mechanical eyes and ears" that Carson wrote of prefigure the many ways in which we scientifically sense the ocean, augmenting the human sensorium through technical prostheses like hydrophones, sonar technologies, lasers, CTD (conductivity, temperature, depth) sensors, and more.[78] The very design of ocean-sensing technologies anticipates the gap between what is perceivable for humans and what is perceivable in the ocean. Indeed, faithful speculations about the milieu-specific conditions of the ocean depend on a prior body of knowledge developed by oceanographers and marine biologists. Yet because the technique of conceptual displacement complements milieu-specific analysis, it is not enough merely to describe the conditions of mediation in the ocean, as distant observers. We have to take a hard look at how the conceptual vocabularies and grammars familiar to media studies hold up under conditions of oceanic submergence, subjected to changes in pressure, temperature, salinity, movement, and the presence of microscopic

life. Conceptual displacement is what brings the observers into the scene of mediation, testing out their readiness to orient within the affordances of a particular ocean environment.

Wild Blue Media expands on key studies of media in the ocean, including works by Nicole Starosielski, John Shiga, Helen Rozwadowski, Stefan Helmreich, and John Durham Peters, to consider how media and mediation occur *through the ocean*.[79] The preposition matters: media "in" the ocean make the ocean seem like a mere container or external environs to be bracketed out from the corrosiveness of saltwater, whereas media "through" the ocean positions the ocean as an optical and sensory medium that the observer actively orients within. A study that focused only on nouns (concepts) would miss this important grammatical detail concerning the role of the chosen preposition, a topic I discuss more extensively in chapter 2. If we have grown used to deploying these concepts only in terms of computational technologies, what necessarily shifts when we relocate their use to oceanic conditions? This epistemic shift is about cultivating a certain humility, aware of how mediation might seem otherwise from another embodied point of view in the milieu of the ocean. Through the speculative method of submerging familiar concepts in new media studies—interface, inscription, and database—*Wild Blue Media* tests how we think about environmental media and mediation underwater.

Although cameras, scuba gear, film, underwater habitats, and digital ocean simulations do make their appearances in this book, my focus is not primarily on media objects but rather on the tension between concepts in media studies and oceanic contexts. Because of its epistemological focus on the environmental conditions of scholarly writing, *Wild Blue Media* differs from existing work in the field of media studies that has primarily dealt with human communication and technical objects that store, record, or transmit information.[80] This includes the history of printing, the advent of sound recording technologies like the gramophone, the history of photographic experimentation and cinema, as well as infrastructural feats like the laying of telephone wires and fiber-optic cables. "Mass media" named an older practice of studying newspapers and television, while "new media" studies has tended to focus on computational technologies, networks, and algorithms. Erkki Huhtamo's and Jussi Parikka's articulation of "media archaeology" takes a longer historical look at media objects beyond the "new," rummaging through "textual, visual, and auditory ar-

chives as well as collections of artifacts, emphasizing both the discursive and the material manifestations of culture."[81] In a systemic sense, scholars like Matthew Fuller propose studying "media ecologies" and their capacities, examining their "interrelationship with knowledge and time management processes, intellectual property regimes, database and software design" and more.[82] By contrast, Neil Postman uses the environmental metaphor of "media ecology" to think about the affordances of media as environments but in doing so risks separating nature and culture in simplistic ways that neglect the way that media technologies themselves depend on natural resources and energy for their condition of possibility.[83]

Such a question is, however, very important in the field of "environmental media studies," which considers a variety of entanglements between media technologies and natural resources. These include the carbon footprint of cinema and digital technologies, the role of media in climate change activism, the way that elements of the environment might facilitate or disrupt communication, the role of the environment as a recording medium or transmission medium, and the role that elements of the natural environment play in media infrastructures.[84] In *Sustainable Media*, Nicole Starosielski and Janet Walker explore "connections that inhere between media *about* the environment and media *in* the environment"—a perspective that outlines something of a feedback loop between environmental activism through media, and the resource dependency of media.[85] Environmental media studies weighs the cost of "the massive amount of energy drawn and expended to power media systems, the extraction of materials to construct media technologies, and the toxicities of use and disposal" against the ways that media "provide a means to come to terms with and help ameliorate the ecological harms produced by industrial processes."[86] The conclusions to chapter 1 and chapter 3 specifically consider the implications of milieu-specific analysis for environmental activism, including how an expanded notion of the interface and a scale-specific consideration of seawater could lead to different forms of environmental awareness and artwork.

Indeed, one of the key aims of *Wild Blue Media* is to expand where we would traditionally look for media, or instances of mediation. Toward this, I draw from recent work in both media theory and environmental media studies by scholars such as John Durham Peters. Peters's approach has been to see the environment *as a medium*, stretching the definition of

media to include not only technical objects but also tree rings, ice cores, geologic strata, and other elements of the natural environment. In this view, the environment is a medium when it demonstrates a functional similarity to anthropogenic technologies of storage and transmission. Peters makes precisely this claim in *The Marvelous Clouds: Toward a Philosophy of Elemental Media* through an analogy between what communication technologies do and what elements of the environment do: "If we mean mental content intentionally designed to say something to someone, of course clouds or fire don't communicate. But if we mean repositories of readable data and processes that sustain and enable existence, then of course clouds and fire have meaning."[87] Such a claim operates through the logic of the retrospective view, where both old and contemporary media technologies allow us to look back at the environment and see the technical work that it has been performing all along: the sky for orientation, geologic strata for storage, ocean for acoustic transmission.[88] In this view, the environment functions analogically as a kind of media infrastructure, or at least presents the conditions of possibility through which transmission, storage, and recording might occur.

Another point of view contends that, rather than trying to define or even expand the definition of what media are, critics should focus on processes and events that encompass biotechnical life. In *Life after New Media: Mediation as Vital Process*, Sarah Kember and Joanna Zylinska call for a shift from studying media objects to studying processes of mediation. Drawing on the philosophy of Henri Bergson and Jacques Derrida, they see objects as only temporary stabilizations within the ongoing becoming of the world. Instead of media, "mediation" becomes a "key trope for understanding and articulating our being in, and becoming with, the technological world, our emergence and ways of intra-acting with it, as well as the acts and processes of temporarily stabilizing the world into media, agents, relations, and networks."[89] Attending to mediation across such varied practices as photography, face transplant surgery, home security surveillance, the Large Hadron Collider, and credit crunch, Kember and Zylinska show how "life itself under certain circumstances becomes articulated as a medium that is subject to the same mechanisms of reproduction, transformation, flattening, and patenting that other media forms . . . underwent previously."[90] The key word here is "articulation"—to be articulated as a medium is not about a stable ontological identity (this is a medium, that is not) but about being enfolded into an assemblage such

that something performs the function of a medium. In a similar vein, Eva Horn advocates engaging with media in terms of processes, transformations, and events. In "There Are No Media," Horn writes, "Media are not only the conditions of possibility for events—be they the transfer of a message, the emergence of a visual object, or the re-presentation of things past—but are in themselves events: assemblages or constellations of certain technologies, fields of knowledge, and social institutions."[91] Horn's more explicitly anti-ontological approach to media avoids answering the knotty question of "what media 'are'" and instead, like Kember and Zylinska, attends to processes of mediation that gradually unfold.[92]

The implication of these anti-ontological theories is that "mediation" would cease to focus on anthropogenic technologies and instead address more distributed phenomena in the world, like the BP oil spill, the Fukushima Daiichi nuclear meltdown, and other protracted events. Indeed, perhaps the key factor that Kember, Zylinska, and Horn introduce is time, along with a broader appreciation of duration as part of media processes. By thinking through temporary stabilizations rather than the persistence of objects, all three scholars take a more processual view that complements environmental justice frameworks like Nixon's "slow violence," attentive to forms of violence that normally extend past human scales of time.[93] *Wild Blue Media* shares an interest in temporal processes of mediation particularly in chapter 1, where I develop a reading of the human lungs as an interface and show how starting from this biological tissue actually involves gas saturation of the entire body. What this allows me to identify are larger-scale instances of interface—for instance, the way our carbon economy saturates the ocean (an important absorber of heat and excess carbon), resulting in increased acidification to the detriment of shelled creatures and coral reefs around the world.

However, this book is not only about making media theory more aware of its conditions of theorization. The reason why it is important for environmental scholars to think about mediation now has to do with a latent media imaginary in discourses about the Anthropocene and climate change. We can see this imaginary at work in descriptions of the sediment or ice cores as "books" of the past, or the idea that in the Anthropocene humans are writing the geologic record. At the same time, other conversations about anthropogenic climate change lament the erasure of different records through sea level rise (submerging human communities), ocean acidification (dissolving the shells of crustaceans and corals), global

warming (causing coral to bleach and die), and more. As I have written about elsewhere, scholarship has tended to superimpose understandings of human media onto environmental processes.[94] Because these conversations about climate change and the Anthropocene both consciously and subconsciously draw on the language of media, it is time to think more critically about the media terminology we are using and the milieu in which it emerged. Answering this question, however, involves not only considering environments of thought, or environments of mediation, but the nature of the embodied observer to whom they are meaningful.

Zoological Comparative Media Studies

In addition to considering environments of mediation, *Wild Blue Media* asks that we also consider the perceptual capacities of the observer to whom these descriptions are meaningful. The importance of the observer takes us to a question that Peters raises in *The Marvelous Clouds* about the species specificity of media. By asking if the ocean is "the greatest medium or the limit point of any possible media," Peters challenges readers to consider how noise for one observer might be information for another.[95] His comparison of whale communication with human communication leads him to argue, "Media are species- and habitat-specific and are defined by the beings they are *for*," as it makes no sense to study whale communication outside the enabling medium of seawater.[96] This focus on the body is key, and addresses the role that animal studies might play in environmental media studies by not assuming a normative sensory apparatus. Peters provocatively suggests that zoology might become "the open book of comparative media studies."[97] This offers a powerful complement to Hayles's formulation of "comparative media studies" in *How We Think*—also the name of an interdisciplinary master's program at MIT.[98] Like comparative literature, comparative media studies emphasizes juxtaposition, attentive to the materiality of media across a variety of instantiations. A zoological comparative media studies addresses not only differences in media materiality and form but also the species specificity of media under particular environmental conditions.

Wild Blue Media depends on the balanced accounting of both species specificity and milieu specificity, attending to the roles of environment and observer in their embodied, cultural, and historical context. This

comes through most visibly in chapter 2, on "vampire squid media," which considers inscription from the perspective of the vampire squid living in the deep abyss in Vilém Flusser's speculative media fable *Vampyroteuthis Infernalis*. In this chapter, I pay close attention to the differences in embodied perception for the vampire squid compared with a human observer, attending to the situated and partial perspectives of each. I also attend to the way that Flusser thinks about the conditions of recording information underwater, and how his speculation folds back (as a fable) into his thinking about the significance of photography. This work finds an echo in Flusser's observation that "one can do gymnastic exercises with perspective," its own form of zoological comparative media studies.[99]

Through this attention to species specificity, *Wild Blue Media* shares kinship with Eduardo Kohn's *How Forests Think: Toward an Anthropology beyond the Human*. Drawing on Peircean semiotics, Kohn explores how something like a tree falling in the rainforest might signify quite differently to a human, compared with a monkey or other forest creature. A similar argument can be found in Jacob von Uexküll's writings on *Umwelt* from the 1930s.[100] Von Uexküll contrasts what he calls the Umwelt, or perceptual world of the tick, with its more general "surroundings," as noticed by human beings. Drawing on the biosemiotic imaginations of Peters, Kohn, and Uexküll, I argue that what count as media depend on whom we imagine they are useful to, with human beings as the normal reference point. However, just because a variety of perceptual worlds may exist specific to individual animals does not mean that there is not overlap and ecological vulnerability. I do not take Uexküll's theory of Umwelt as evidence that there is no common "world" to be shared by all species. While this may be true at the level of perception, this cannot be true at the level of materiality or transcorporeality. Nuclear radiation, for example, exerts its effects whether or not a living being is aware, an invisible threat whose effects often register many years after exposure.

Zoological comparative media studies raises a key question about perception and narrative: Through what means might one approximate the point of view of an animal? Toward this, Eva Hayward's oceanic work is a powerful example of thinking about mediation and phenomenology in species-specific ways while also accounting for transcorporeal interconnection. To us, other sea creatures would seem to possess modes of synesthesia that combine at least two of "our" senses. Octopuses can taste with their tentacles, while coral polyps are both light sensitive and touch

sensitive. Hayward's work on the "fingery-eyes" of cup corals productively shifts the traditional focus of phenomenology on the human body to the perceptual attunements of marine invertebrates, who operate within perceptually different worlds.[101] From naturally occurring transsexual fish to asexual jellies and colonial organisms, sea creatures destabilize our expectations of heteronormativity, individuality, and perception across species. In *Wild Blue Media*, I consider these lessons about species-specific perception as a lesson about media anthropocentrism, or how media designs (necessarily) favor human perceptual capacities—a form of partial perception and situated knowledge. *Wild Blue Media* explores the milieu specificity of processes of mediation, while being aware that what is noise for a human might be information for a dolphin. Meaning emerges in species-specific and milieu-specific contexts and habituations of perception.

Chapter Descriptions

As a chimera in form, *Wild Blue Media* channels the literary and science fictional technique of conceptual displacement in order to denature what we have come to expect out of our media technologies. Following this introduction, each of the three core chapters of this book takes a concept in media theory—interface, inscription, and database—and submerges it underwater. These key terms roughly correspond to Friedrich Kittler's definition of media in terms of "recording, storage, and the processing of information."[102] While Kittler's terms operate fairly intuitively in terrestrial contexts—we might imagine recording as typing on a computer, storage as a hard drive, and information processing as the printing of a text file or rendering of an animation—the ocean environment presents other challenges. If seawater is a storage medium, then it is not the same kind of "storage" we imagine that happens with a digital database, where all the records stay put. The ocean also changes how we understand the possibilities of recording or inscription in the sense of making marks on a page or a stone tablet. Underwater, any in-*script*-ions would be eroded, washed away, or overgrown with marine plants and animals. Rather than Kittler's third term, "processing," I use "interface" as my third term to think within the ocean, considering how the conditions of pressure in the ocean necessitate a three-dimensional rather than flat understanding of the interface. In these ways, the alterity of the ocean environment chal-

lenges how we have traditionally thought of the conditions for media as dry processes. However, it is important to me that this book not be read as a "keywords" project, which has a kind of encyclopedic logic and no rationale for its delimitation. Instead, I intend interface, inscription, and database to serve as a kind of generative matrix for thinking through the conditions of possibility for media in the ocean environment, a matrix I bring together in a final chapter on underwater museums.

Chapter 1, "Interface: Breathing Underwater," plunges the reader into the ocean through its analysis of how narratives of scuba diving change the way we understand the concept of the interface in media theory. I trace the ways that the watery etymology of the term *interface* as the surface between two fluids has reified a particular way of understanding of it as a surface. While media theorists have described the interface as any surface across which human users can exercise control (screens, keyboards), diving suggests a relationship with technology that is less about control than about participation and vulnerability. By starting with the lungs rather than other forms of technical interfaces, I develop a theory of interface through the biological process of tissue saturation. Tissue saturation involves considering the role of time and pressure (measurable in atmospheres) on divers, where not just the lungs but the whole body figures as a distributed interface. I blend readings of diving memoirs by Jacques Cousteau and Sylvia Earle, two of the most visible figures in ocean environmentalism, with ocean science fictions by Greg Egan and James Blish that portray submerged humans. These literary texts demonstrate key media perspectives on thinking about interfaces, meditating on the process of breathing underwater, the significance of time and pressure, and on the surface as a kind of "chronotope."[103] They also lead me to identify the anthropocentrism embedded within one of the key debates in literary studies: "surface reading" versus a hermeneutics of suspicion, both of which assume the interpreter does their work from the plane of a surface, gazing down into the depths (psychological, textual, or other). By attending to the physiological conditions of diving underwater in these two narrative accounts, I show how oceanic immersion suggests a different interpretive vantage point, involving a distributed technical interface between air, body, regulator, and tanks that provides a temporary condition of amphibiousness. This new physiological and ecological way of looking for instances of saturated interface in the world—for example, in phenomena like ocean acidification—models a way of bringing together

oceanic theories of mediation alongside matters of climate change and environmental justice.

The ocean not only changes the way we think about interfaces; it also changes how universally we should think about the concept of inscription in media theory. As a cold liquid environment swirling with dissolved chemicals and planktonic life, the ocean presents conditions of mediation that may have less to do with marks and the reading of signs than on residues and processes of camouflage. Chapter 2, "Inscription: Vampire Squid Media," follows Vilém Flusser's unusual text *Vampyroteuthis Infernalis*, which takes up the challenge of imagining what forms of media would exist for the vampire squid living in the deep abyss. In the abyssal environment of *Vampyroteuthis infernalis*, inscription on paper or even stone tablets is eventually eroded by seawater or encrusted with growth; Flusser's vampire squid communicates through the noninscriptive media of liquid ink clouds and skin paintings. Flusser considers how the unique physiology of the vampire squid gives rise to particular forms of spatial cognition, what kind of media would be available to the vampire squid living in the deep abyss, and what might constitute lasting forms of information storage underwater. If the squid were a theorist, how would it metaphorically speak about its world? Flusser models a science fictional perspective on media theory by assuming that the entity using media is a cephalopod rather than a human. In so doing, he also asks that we consider the role of both the environment and human desire in shaping what kinds of media we design—and value.

The two methods I develop in this book, milieu-specific analysis and conceptual displacement, are both explicitly Flusserian. Conceptual displacement, as I have already written, links Flusser with critical traditions in science fiction studies and the productive estrangement that emerges from such situations. In asking about the possibility of media in the abyss, Flusser's vampire squid fable also models a version of milieu-specific analysis as the attention to the significance of the environment of critical, theoretical, and philosophical writing. Indeed, it is the abyss that characterizes how Flusser imagines the vampire squid's media (ink clouds, skin paintings), ephemeral forms that make their impressions through memory rather than through marks on pages or stone. The abyss also contributes to the way that the vampire squid orients to its world through language. Through a discussion of Lakoff and Johnson's theories of orientational metaphor, I show how Flusser's vampire squid might bring us

to a greater awareness of the terrestrial bias in the ways we figuratively speak about the world.

However, Flusser's vampire squid fiction also operates on an allegorical level, as a fable about photography. I argue that Flusser's fictional science fable imagines the abyssal world of the vampire squid as a pretext for considering photography as a medium that marks a transition in society from valuing objects, like individual photographs, to the information transmitted, such as a film negative. Unlike earlier theories of photography (Roland Barthes, Susan Sontag, Joel Snyder), *Vampyroteuthis infernalis* is different in form, taking the abyss as a literary environment for media theory. Evoking the methodological tradition of science fiction's "cognitive estrangement," *Vampyroteuthis Infernalis* invents a comparative epistemology between human and vampire squid in order to gain critical distance on photography. Yet Flusser also wonders whether society might be becoming more "vampyroteuthic," valuing the inscription of information directly on subjects rather than on objects. At this allegorical level of interpretation, the vampire squid fable works as a sort of alien mirror within which to recognize similarities with our technological present. In this way, Flusser's speculation never loses sight of the human observer as "mediating" what it is possible to know about the vampire squid, avoiding the pitfall of physiological determinism.[104] The chapter ends by imagining the role of liquids in photography and digital media, using Ted Chiang's "The Story of Your Life" and "Exhalation" to consider not only media materiality but the significance of interpretation in terms of what counts as a mark or inscription. I define "noninscriptive media" not in permanent ontological or material terms that are limited to substances like fluids and gases but in terms of recognition on behalf of the reader or interpreter, developing my own fable about the Hawaiian bobtail squid and symbiotic counterillumination.

Moving from inscription to questions of storage, chapter 3, "Database: Proteus and the Digital," analyzes the assumption that the ocean is a "natural database" by looking at how two different data visualizations, Google Ocean and the artwork ATLAS *in silico*, render seawater. Where chapter 2 concerns metaphorical estrangement, chapter 3 explores the stakes of naturalized metaphors—when flows of information and oceanic databases obscure the material differences between digital technologies and oceanic media. I show how a conception of information storage in computational contexts values the preservation of data intact, something that would be

challenged by an environment of seawater. Indeed, the chemical and vital properties of seawater transform what is stored underwater through processes of erasure, encrustation, and saturation. Seawater asks us to rethink terrestrial notions of the archive or database as informed by the language of earth and sediment, and instead consider storage in terms of seawater's capacity for protean transformation. The scale at which we look at seawater matters; the protean properties of seawater are meaningful at a macroscale (as in Google Ocean), but on increasingly microscopic scales, processes of abstraction make seawater commensurate with digitality (as in ATLAS *in silico*). In this way, milieu-specific analysis constitutes a sensitivity to representations of the ocean in digital media, including the questions of how the ocean is visually rendered as an object for interaction and interpretation—and the descriptive language that obscures these mediations.

Wild Blue Media concludes with chapter 4, "Underwater Museums: Diving as Method," which brings together considerations of interface, inscription, and database to ask: what changes when we imagine the "museum" underwater, and how can scuba diving become a humanities practice? I discuss my exploration and documentation of Jason deCaires Taylor's underwater sculpture museums in Isla Mujeres, Mexico, and the nearby cenotes (underwater caverns) in Tulum, Mexico. The sculptures not only exist as tourist sites that scuba divers can visit but are more commonly encountered as a series of high-quality photographs circulated online (and even as a Google Street View destination). I approach the sculptures from the perspective of comparative media studies, looking at the way they exist across digital, oceanic, and terrestrial installations, drawing on my training as a scuba diver to study them in situ. As a point of contrast, I compare Taylor's underwater museum with naturally occurring cenotes or underwater limestone caverns, considering the role of optical phenomena, bubbles, the halocline, and other boundary matters. I make the case for scuba diving as a humanities methodology that not only figures as a form of witnessing but also constitutes a meaningful interpretive practice that trains the diver to read from below.

I write this book, in part, due to my lifelong obsession with the wonderfully enchanting alterity of marine creatures and as a response to the real anthropogenic threats that the ocean faces today. To channel Walter Benjamin's statement about historical memory, the ocean flashes up in

the moment of danger that is climate change.[105] Yet the years that have gone into crafting this book have not focused on marine spatial planning, or fisheries regulation, or climate change policy. I think of this book as a "pre-activist" book, in the hopes that thinking through the ocean will alter and add to the storytelling and analytical techniques available to everyone.

NOTES

Preface

1 Beebe, "Descent into Perpetual Night," 475.

2 Beebe, "Descent into Perpetual Night," 478.

3 "Homer used two adjectives to describe aspects of the colour blue: *kuaneos*, to denote a dark shade of blue merging into black; and *glaukos*, to describe a sort of 'blue-grey,' notably used in Athena's epithet *glaukopis*, her 'grey-gleaming eyes.' He describes the sky as big, starry, or of iron or bronze (because of its solid fixity). The tints of a rough sea range from 'whitish' (*polios*) and 'blue-grey' (*glaukos*) to deep blue and almost black (*kuaneos, melas*). The sea in its calm expanse is said to be 'pansy-like' (*ioeides*), 'wine-like' (*oinops*), or purple (*porphureos*). But whether sea or sky, it is never just 'blue.' In fact, within the entirety of Ancient Greek literature you cannot find a single pure blue sea or sky." Sassi, "Sea Was Never Blue."

4 See, for example, Mentz, *At the Bottom of Shakespeare's Ocean*; *PMLA* 125, no. 3 (May 2010), special section on "ocean studies"; Gillis, "Blue Humanities," in the magazine of the National Endowment for the Humanities.

5 Cronon, "Trouble with Wilderness," 89.

6 Halberstam, "Wildness, Loss, Death," 147.

Introduction

1   A full set of diving gear includes mask, snorkel, fins, weights, wet suit, tanks, buoy-
    ancy control device (BCD, or vest), regulator, backup regulator, BCD inflation hose,
    and submersible pressure gauge. If you dive in cold water, you will need a hood, gloves,
    insulated booties, and either a 7mm wet suit or a dry suit.

2   Burnett, "Looking at the Surface."

3   Seminar title advertised by the Divers Alert Network, accessed May 19, 2014, http://www
    .diversalertnetwork.org/training/seminars/breathing/.

4   As Stephanie Merchant notes in "Deep Ethnography: Witnessing the Ghosts of SS
    Thistlegorm," PADI programs promote the horizontal glide, with arms folded across
    the chest, as a streamlined, normative posture. Initially, I preferred to have my hands
    out in front of me but have since conformed.

5   Anthropologist Marcel Mauss's discussion of what he calls "techniques of the body"
    proceeds from an example about swimming and the ways that teaching children how
    to swim have changed over time. Rather than teaching them to swim, dive, and then
    open their eyes underwater, Mauss writes how a newer method starts by getting chil-
    dren comfortable in the water, including opening their eyes. Thus, "even before they
    can swim, particular care is taken to get the children to control their dangerous but
    instinctive ocular reflexes, before all else they are familiarized with the water, their
    fears are suppressed and a certain confidence is created, suspensions and movements
    are selected." Mauss, "Techniques of the Body," 71.

6   Cousteau, *Silent World*, 3.

7   Of course, many people become extremely adept at adapting to new milieu (consider
    gymnast Simone Biles's talent for orienting in the air). Yet just because one can learn
    to swim well, or parachute well, or throw aerials does not necessarily mean that the
    way one speaks about movement and orientation will suddenly change; language is a
    collective practice.

8   In her discussion of the amphibious lifeworlds of the nomadic Bajau people living
    in the Coral Triangle, Annet Pauwelussen writes that amphibiousness refers to "the
    capacity to move in both marine and terrestrial environments" and "the capacity to
    move in and between worlds that relate and partly intermingle, yet are not reducible
    to one another." Pauwelussen, "Amphibious Anthropology," 3. In chapter 1, "Interface:
    Breathing Underwater," I discuss a conditional version of amphibiousness in scuba
    diving as excommunication from the surface world as the price for spending time
    below.

9   Wittgenstein, *Philosophical Investigations*. Of course, coastal and seafaring cultures also
    offer their own vocabularies for the ocean. For example, in *Waves of Knowing*, Karin
    Amamoto Ingersoll discusses indigenous forms of ecological knowledge in Hawai'i
    that formed through the practice of traditional surfing and its vocabularies for types
    of water, weather, and movement.

10 Godfrey-Smith, *Other Minds*; Balcombe, *What a Fish Knows*.

11 Helmreich, *Sounding the Limits of Life*; Shiga, "Sonar."

12 Felt, *Soundings*. Rebecca Rutstein has produced a series of stunning sculptures and paintings inspired by Marie Tharp's work. For a description of her exhibition *Fault Lines*, see http://www.formandconcept.center/rebecca-rutstein-fault-lines-exhibition/, accessed June 1, 2019. More of the artist's work can be seen at http://rebeccarutstein.com/, accessed June 1, 2019.

13 Helmreich, *Alien Ocean*.

14 Gabrys, *Program Earth*; see chapter 2, "From Moss Cam to Spill Cam," and chapter 7, "Sensing Oceans and Geospeculating with a Garbage Patch."

15 Carson, "Undersea," 4.

16 Carson, "Undersea," 4–11.

17 Gabrys, "From Moss Cam to Spillcam" in *Program Earth,* 57–80.

18 Schuppli, "Slick Images."

19 Starosielski and Walker, *Sustainable Media.*

20 Merchant, "Negotiating Underwater Space," 230.

21 Alaimo, "Foreword" to *Disability Studies and the Environmental Humanities*, xi.

22 Burnett, "Looking at the Surface."

23 Ahmed, "Orientations Matter," 274. By inquiring about the background of the tables themselves, Ahmed reminds us that tables appear in Marxist and feminist conversations about labor and privilege. The feminist table is a "disorientation device" to the extent that it poses the question: who has time to sit quietly at tables, or better, who has a clear table, ready for writing?

24 Ahmed, "Orientations Matter," 253. The feminist implication of the argument, then, points to the "political necessity of clearing spaces in order that some bodies can work at the table."

25 Ingold, "Earth, Sky, Wind, and Weather," S29.

26 Rozwadowski, *Fathoming the Ocean*.

27 This image of the human sitting at an underwater desk was playfully but seriously brought into realization by former Maldives president Mohammad Nasheed's "Underwater Cabinet Meeting" from 2009 (see plate 3).

28 For more on the role of metaphor in science studies, see, for example, Beer, *Darwin's Plots*; Lakoff and Johnson, *Metaphors We Live By*.

29 Dick, "My Definition of Science Fiction," 100.

30 Suvin, *Metamorphoses of Science Fiction*, 15–27. To develop his theory of estrangement, Suvin drew on the early twentieth-century Marxist playwright Bertold Brecht's term *Verfremdungseffekt* (estrangement/alienation effect), a theatrical technique that makes the audience self-aware of themselves as observers rather than immersed in the drama that enfolds them. I share this Brechtian goal of terminal defamiliarization, provoking a new unsettled state in the reader/observer.

31 Jue, "Intimate Objectivity."

32 BBC, *Blue Planet*, "The Deep," September 19, 2001.

33 Yaszek, "Science, Fiction and American Public Policy"; Thomas, "Forms of Duration."

34 Haraway, "Situated Knowledges," 196.

35 Haraway, "Situated Knowledges," 187.

36 D. Smith, "Women's Perspective as a Radical Critique of Sociology"; Harding, "Rethinking Standpoint Epistemology: What is 'Strong Objectivity'?"; Collins, "Learning from the Outsider Within."

37 D. Smith, "Women's Perspective as a Radical Critique of Sociology," 7.

38 Haraway, *Modest_Witness@Second_Millennium*, 37.

39 Abram, *Spell of the Sensuous*, 24.

40 Abram, *Spell of the Sensuous*, 42.

41 Abram, *Spell of the Sensuous*, 42.

42 Bourdieu, *Logic of Practice*, 56.

43 Bourdieu, *Logic of Practice*, 54, 53.

44 Bourdieu, *Logic of Practice*, 54.

45 Luce Irigaray's *Marine Lover of Friedrich Nietzsche* exemplifies such a project.

46 Canguilhem, "Living in Its Milieu."

47 McLuhan, *Understanding Media*, 8.

48 McLuhan, *Understanding Media*, 8.

49 Guillory, "Genesis of the Media Concept," 321.

50 "It quickly emerged that the unique and proper area of competence of each art coincided with all that was unique to the nature of its medium. The task of self-criticism became to eliminate from the effects of each art any and every effect that might conceivably be borrowed from or by the medium of any other art." Greenberg, "Modernist Painting," 775.

51 Hayles, *Writing Machines*.

52 For a critique of the geologic paradigm, see Simonetti, "Stratification of Time."

53 J. J. Cohen, *Prismatic Ecology*.

54 Feld, "Acoustemology"; Lopez, *Arctic Dreams*; Valentine, "Gravity Fixes."

55 Brathwaite, *ConVERSations with Nathaniel Mackey*; Deloughrey, *Routes and Roots*; Glissant, *Poetics of Relation*; Hessler, *Tidalectics*.

56 Ingold, "Earth, Sky, Wind, and Weather," S32.

57 For more on the aspiration of purification, see Latour, *Pasteurization of France*.

58 Nixon, *Slow Violence and the Environmentalism of the Poor*.

59 Nixon, *Slow Violence and the Environmentalism of the Poor*, 9.

60 See, for example, the special section on "ocean studies" in *PMLA* 125, no. 3 (May 2010); Gillis, "Blue Humanities"; Mentz, *At the Bottom of Shakespeare's Ocean*; Brayton, *Shakespeare's Ocean*.

61 Early work in the ocean humanities called for a study of the circulation of bodies, texts, and commodities across oceans rather than continents. Paul Gilroy's pathbreaking text, *The Black Atlantic: Modernity and Double Consciousness*, showed that a version of area studies based around continents (North American studies, European studies, African studies) was inadequate for an analysis of the Middle Passage and its legacies because the slave trade took place across oceans. Gilroy argued that cultural

historians might instead "take the Atlantic as one single, complex unit of analysis" and use it to produce transnational and intercultural perspectives, a necessary reconceptualization for studying the Middle Passage and African diaspora. Gilroy, *Black Atlantic*, 15. As a consequence of Gilroy's intervention, the field of literary studies has explored configuring around ocean basins rather than continents. The primal scene of the slave trade has since appeared in a number of oceanic literary studies, which have approached the ocean as a space where bodies disappear and transform, where property is lost, and where ships traverse currents to the new world—a submarine imaginary I discuss in chapter 4, on underwater museums. See Baucom, *Spectres of the Atlantic*; Allewaert, *Ariel's Ecology*; Wardi, *Water and African American Memory*; Deloughrey, *Routes and Roots*; Sharpe, *In the Wake*.

62 Helmreich, *Sounding the Limits of Life*, 186.

63 M. Cohen, *Novel at Sea*; Casarino, *Modernity at Sea*; Mentz, *At the Bottom of Shakespeare's Ocean*; Mentz, *Shipwreck Modernity*; Brayton, *Shakespeare's Ocean*.

64 Best and Marcus, "Surface Reading."

65 The field of geography has advanced its own critique of a terrestrial bias in ocean space, a topic I take up in more detail in chapter 3 in a discussion of Google Street View. For example, Philip Steinberg's key text *The Social Construction of the Ocean* and the collection *Water Worlds: Human Geographies of the Ocean*, coedited by Jon Anderson and Kimberly Peters, move beyond geography's focus on the terrestrial and fixed senses of space. They aim to develop an ocean specificity adequate to its fluid and mobile properties, moving from the geographic to the hydrographic. Other ocean humanities scholars have explored the traditional navigational practices of non-Western seafaring peoples and their implications for spatial theory. Each of these studies foregrounds the ways that contact with the ocean shapes one's ways of orientating and navigating within the world as a knowing subject. Edwin Hutchins's study *Cognition in the Wild* contrasts Western paradigms of navigation (where the landscape is fixed, and you move around it) to Micronesian navigating practices (where you are still, and the environment moves around you), focusing on theories of cognition. Deloughrey's *Routes and Roots* takes the concept of "tidalectics"—or "tidal dialectics," borrowed from Brathwaite—as a starting point for thinking through transoceanic imaginaries in indigenous and diasporic literary studies.

66 Baucom, "Hydrographies," 308.

67 Kroll, *America's Ocean Wilderness*.

68 Brayton, *Shakespeare's Ocean*.

69 Steinberg and Peters, "Wet Ontologies, Fluid Spaces."

70 For example, in *We Are the Ocean*, anthropologist Epeli Hau'ofa contrasts the notion of islands isolated "in" the sea with an understanding of a more networked "sea of islands" connected by water and the seafaring practices of peoples in Oceania. Similarly, Teresa Shewry's *Hope at Sea: Possible Ecologies in Oceanic Literature* works through oceanic interconnection rather than isolation as a precondition for the formation of hope: "A shark, a river, a forest, a community, a memory, or an imaginary are all

agents that may allow people an awareness of future openness and promise." Shewry, *Hope at Sea*, 3. In *Waves of Knowing: A Seascape Epistemology*, Karen Ingersoll shows how indigenous practices of surfing in Hawai'i become a way of navigating in the world and producing ecological knowledge.

71   Bachelard, *Water and Dreams*, 6.

72   Other work on seawater specifically (as opposed to fresh or "sweet" water) has been potent in imagining specifically feminine alterity. Luce Irigaray's *The Sex Which Is Not One* explores fluid mechanics as a figuration for understanding feminine forms of power and being that are of another order entirely from those of patriarchy. Yet in their chapter "Water and Gestationality" in *Thinking with Water*, Mielle Chandler and Astrida Neimanis eschew any hard-and-fast groundings of water in any particular gender, offering the term *gestationality* to identify how water may help us rethink agency. For Chandler and Neimanis, "gestationality defies the either/or structure of activity and passivity; it is neither active nor passive, and yet both active and passive." Chandler and Neimanis, "Water and Gestationality," 62. See also Alaimo, "States of Suspension."

73   Alaimo, "States of Suspension," 476.

74   Alaimo, "States of Suspension," 477–78.

75   Posthuman subjectivity has also been taken up in the context of water and race. Monique Allewaert's *Ariel's Ecology* argues that eighteenth-century American plantations gave rise to particular ecologies and labor practices that blurred the boundaries between persons and environment, offering a genealogy of posthuman subject formation squarely anchored in the transatlantic slave trade. Christina Sharpe's *In the Wake: On Blackness and Being* traces the ways that the slave ship marks and haunts contemporary black life as a specter of containment, situating white supremacy as a kind of weather or climate that produces premature black death. Her analytic of "wake-work" conjures the wake of the ship, the wake of the funeral, and the sense of consciousness of being awake in order to imagine ways to live and survive in the wake of slavery and "the afterlife of property." Sharpe, *In the Wake*, 18. Eva Hayward argues that race and racial thinking have shaped how we understand oceans and marine life, as registered by artist Ellen Gallagher's *Watery Estatic*, Sigmund Freud's "Oceanic Feeling," and the Detroit music group Drexciya and its mythologization of slaves who survived the Middle Passage to create their own undersea bubble metropolis. Hayward, "Wail Bones."

76   Sculptor Jason deCaires Taylor has recently dedicated work to this theme. Taylor's *Raft of Lampedusa* features a sunken sculpture of human figures adrift on a small raft, made out of his signature concrete that encourages coral growth. Yet because the sculpture is already underwater, it appears as a kind of memorial to those North Africans already lost in the Mediterranean crossing.

77   Carson, *Sea around Us*, 15.

78   Rozwadowski, *Machine in Neptune's Garden*.

79   In the last decade, several key studies have emerged that concern infrastructure and

methods of remote sensing in the ocean. Nicole Starosielski's *The Undersea Network* patiently outlines the history of undersea cables across ocean basins that constitute vital communication networks—including telegraphs—and today's fiber-optic network that channels the majority of global internet traffic. John Shiga's work on the history of sonar technologies in "Sonar" and "Ping and the Material Meaning of Ocean Sound" looks at the intersection of the military industrial complex and the characterization of the ocean as a transmission medium. Helen Rozwadowski's historical research on the history of marine technologies and oceanographic voyages in *Fathoming the Ocean* outlines older modes of oceanic measurement, from dredging to find seafloor animals to measuring ocean depth by sounding (dropping a length of weighted rope). In many of these studies, remote-sensing technologies necessarily translate signals into (usually visual) formats that are calibrated to the human sensorium. Taking interest in acoustic technologies that transduce sound into visual formats for human interpreters, in *Alien Ocean* Helmreich draws an analogy between signal transformation and the work of anthropology to develop the idea of a "transductive ethnography." How we come to know about the ocean as a medium depends on the particularities of the technical instruments that scientists use to study the "information" in the seafloor sediment, and how these instruments transduce or transform what they detect into forms that are (visually) legible for human observers. Channeling a Latourian sensibility for tracing chains of mediation, Helmreich's transductive ethnography is a reminder to consider all the mediating apparatuses, fluids, and signal translations that contribute to making features of (oceanic) environments tangible to scientists and nonscientists alike.

80 Kittler, *Draculas Vermächtnis*, 8.

81 Huhtamo and Parikka, *Media Archaeology*, 3.

82 Fuller, *Media Ecologies*, 3.

83 Postman, "Humanism of Media Ecology," 11.

84 Recent studies about the environmental impact of media technologies include Maxwell and Miller, *Greening the Media*; Gabrys, *Digital Rubbish*; Maxwell, Raundalen, and Vestberg, *Media and the Ecological Crisis*; Parks and Starosielski, *Signal Traffic*; J. Smith, *Eco-Sonic Media*; Rust, Monani, and Cubitt, *Ecomedia*; Parikka, *Medianatures*; Hu, *Prehistory of the Cloud*.

85 Starosielski and Walker, *Sustainable Media*, 3. In a later chapter in this edited volume, Minori Ishida compellingly demonstrates the necessity of looking for feedback loops, showing how radiation from the Fukushima Daiichi nuclear meltdown corrupted photographic documentation of the event itself. See Ishida, "Lack of Media," 125–27. Jussi Parikka also charts a series of feedback loops between how geology produces media, and how media frame how we see and understand and investigate geology, envisioning a version of media theory "irreducible to the enthusiasm for software." Parikka, *Geology of Media*, 28.

86 Starosielski and Walker, *Sustainable Media*, 3.

87 Peters, *Marvelous Clouds*, 4.

88 Helmreich, *Sounding the Limits of Life*; Shiga, "Ping and the Material Meanings of Ocean Sound"; Peters, *Marvelous Clouds*; Eidsheim, *Sensing Sound.*

89 Kember and Zylinska, *Life after New Media*, xv.

90 Kember and Zylinska, *Life after New Media*, xiii.

91 Horn, "There Are No Media," 8.

92 Horn, "There Are No Media," 8.

93 Nixon, *Slow Violence and the Environmentalism of the Poor.*

94 Jue, "Anthropocene's Negative Media."

95 Peters, *Marvelous Clouds*, 55.

96 Peters, *Marvelous Clouds*, 55–56.

97 Peters, *Marvelous Clouds*, 112.

98 Hayles, *How We Think*, 17.

99 Flusser, *Writings*, 184.

100 Von Uexküll, *Foray into the Worlds of Animals and Humans*, 44–52.

101 Hayward, "Fingery-Eyes"; see also Hayward, "Enfolded Vision"; Hayward, "Sensational Jellyfish"; Hayward, "More Lessons from a Starfish."

102 Kittler, *Draculas Vermächtnis*, 8. Norm Friesen also identifies transmission, storage, and processing as Kittler's key terms for defining media functions. Friesen, *Media Transatlantic*, 103.

103 Bakhtin, *Dialogic Imagination.*

104 See Katherine Hayles's critique of object-oriented ontologies in "Speculative Aesthetics and Object-Oriented Inquiry."

105 Benjamin, "Theses on a Philosophy of History," 255.

One. Interface

1 Hookway, *Interface*, 59–60.

2 Throughout *World without Sun*, the fantastical imagery of advanced underwater technologies is tempered by Cousteau's voice-over, full of domestic analogies. Not only does the submarine dock in a "garage" but the men "sunbathe" in the underwater habitat Conshelf II (replete with sunglasses and a leisure book), and they even bring a pet parrot.

3 Drucker, "Reading Interface," 213.

4 Breathing pressurized air in a decompression chamber and breathing pressurized air underwater produce different physiological responses. According to an article in *Alert Diver* magazine, immersion in water does matter because of the temperature change. Thermal stress from colder temperatures results in changes in blood circulation and the urge to urinate: "Many people do not fully appreciate the physiological impact of being immersed in water. An immediate response to the hydrostatic pressure is that