THINGS THAT GREW WHILE I LOOKED AT THE GROUND

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Cover Image: Crab holes and *Iva frutescens* in Jacob's Point, Warren, RI.

Things that Grew While I Looked at the Ground

A thesis presented in partial fulfillment of the requirements for the degree of Master of Fine Arts in the Department of Printmaking of the Rhode Island School of Design, Providence, Rhode Island.

BY

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Opposite page: Marsh grasses, Jacob's Point, Warren, RI.

Broadly speaking, I am interested in the role of fine arts in translating the complexities of natural systems. This particular body of work explores the relationship between printmaking and soil science—just one of the many possible relationships between arts and sciences—with a focus on salt marsh soil systems. Generating public interest soil systems and other hidden ecological systems can be difficult due to the opaqueness of language and concepts surrounding these systems and a perceived distance (physically or conceptually) from the general public. Printmaking—with its inherent multiplicity, mediation, and readability—offers opportunities for making the seeming abstraction of soils evocative and relatable. The prints, artist books and installations presented here reflect on ten months of artistic and scientific experiences at Jacob's Point, a salt marsh in Warren, Rhode Island. The vastly different scales—immersive installation and intimate bookwork—offer viewer experiences that are both expansive and intimate. My hope is that this work encompasses the physical experience of place, and evokes the power of an environment to inspire play, care, community and generosity.

In loving memory of John McMordie,
whose love for learning and genuine enthusiasm
for other people's passions has (and always will)
inspire everything I make.

Working on a landfill or a forest, or a wheat field, your heart needs to be warm and nutritious like the soil, your endurance and belief as strong as the rays of the sun or the wind. Your "inner soil" has to be rich with nutrients. One calls it soil health, the other fertility. I call it life and fertile thinking.

-Agnes Denes, interview in *Field to Palette: Dialogues on Soil and Art in the Anthropocene*

INTRODUCTION

I spend a lot of time moving across soil—walking, running, biking, meandering, crawling (I'm not above crawling). Most recently I've added wading to my preferred modes of transportation. The first time I stepped onto a salt marsh in May 2019, I was thrown off by the multitude of physical sensations. My feet disappeared into the grasses and sunk deeper into the ground than I expected. Water seeped through the mesh of my sneaker. Even after spending the past ten months visiting the marsh once a week, wading through those grasses unnerves me. I am slightly disgusted by the natural sulphur smell, alarmed by every sound under my foot, and confused by the topography. Never have I experienced a soil that appears flat and yet is pitted and peaked.

I move slower on the salt marsh than I do anywhere else, in large part because I cannot see where my feet are. I find it important to know what my feet are making contact with, and more importantly, what impact my presence has on that surface (whether immediate or long-term). It's become a running joke between my friends and hiking buddies to ask my opinion of the soil whenever we're out on the trail: "What do you think… is this soil good?"

While it's normally asked of me in jest, the question is an important one. No matter where you are on the planet, the health of the soil impacts food and energy

Opposite page: Footprints and tiretracks on a red dirt road in Guyana.

systems, the filtration of pollutants, and carbon sequestration.[1] In the Northern Hemisphere alone, it is estimated that vegetation and soil combined sequester 1 to 2 Pg^2 of carbon each year.[3] Salt marsh soil systems in particular—the squishy, saturated and sulphuric soils that so threw me off—are immensely valuable on a global and local scale. Historically, they have been a source of building materials and food for people and other animals. (Many salt marshes were, at one time, pasture.). Recent studies have shown salt marshes are also especially adapted to filtering pollutants and storing carbon, both of which help mitigate climate change.

These facts and numbers, while they succinctly describe the quantitative value of soils, do very little to generate public interest in soils. Soils, like many other environmental systems, are difficult to generate public excitement for due to their perceived (conceptual) distance and the obliqueness of the language and science surrounding them.[4] Too often people conflate the word "dirt" with "soil", but soil is so much more than dirt. Soil is alive and active. Vast communities of microorganisms, networks of root systems, and pathways for water movement. Soils are dynamic. Organic material interacts with inorganic material in a constant cycle of growth and decay. My favorite definition of soil comes from a professor's introduction in the first (and only) soil science class I took back in 2013: "Soil: the excited skin of the earth."[5]

Soil is definitely excited and active, but how can we communicate just how exciting it is? In an attempt to break down this complexity and generate genuine interest, a scientist may present a beautifully designed and illustrated diagram filled with impressive statistics. A farmer like Wendell Berry might wax poetic about the life-giving, community-building beauty of soils. A painter like Ulrike Arnold may fill a gallery with colorful paintings made solely from soil. Yet the vast complexity of soils may still be inadequately expressed because soil is "challenging to represent as beautiful without a refined knowledge of its inherent qualities."[6] The soil scientist, the famer, and the painter working with soils know the value and beauty of the soil because they have *experienced* it firsthand.

My recent interest in and appreciation for soils was fed by the opportunity to follow researchers into the field and see the ecosystem through their lens. I experienced the sights, smells, and bodily sensations of being in the marsh *while* learning about the marsh system and its functions. It was through my experiences with these researchers

1 Keryn B. Gedan, Andrew H. Altieri, and Mark D. Bertness, "Uncertain Future of New England Salt Marshes," *Marine Ecology Progress Series* 434 (July 28, 2011): 229–37, https://doi.org/10.3354/meps09084.

2 Petragram (Pg) is a unit of mass equal to 1,000,000,000,000,000 grams.

3 Wilfred M. Post and K. C. Kwon, "Soil Carbon Sequestration and Land-Use Change : Processes and Potential," vol. 6(3) (*Global Change Biology*, 2000), 317–27, https://doi.org/10.1046/j.1365-2486.2000.00308.x.

4 Joost M. Vervoort *et al*., "A Sense of Change: Media Designers and Artists Communicating about Complexity in Social-Ecological Systems," *Ecology and Society* 19, no. 3 (2014), https://doi.org/10.5751/ES-06613-190310.

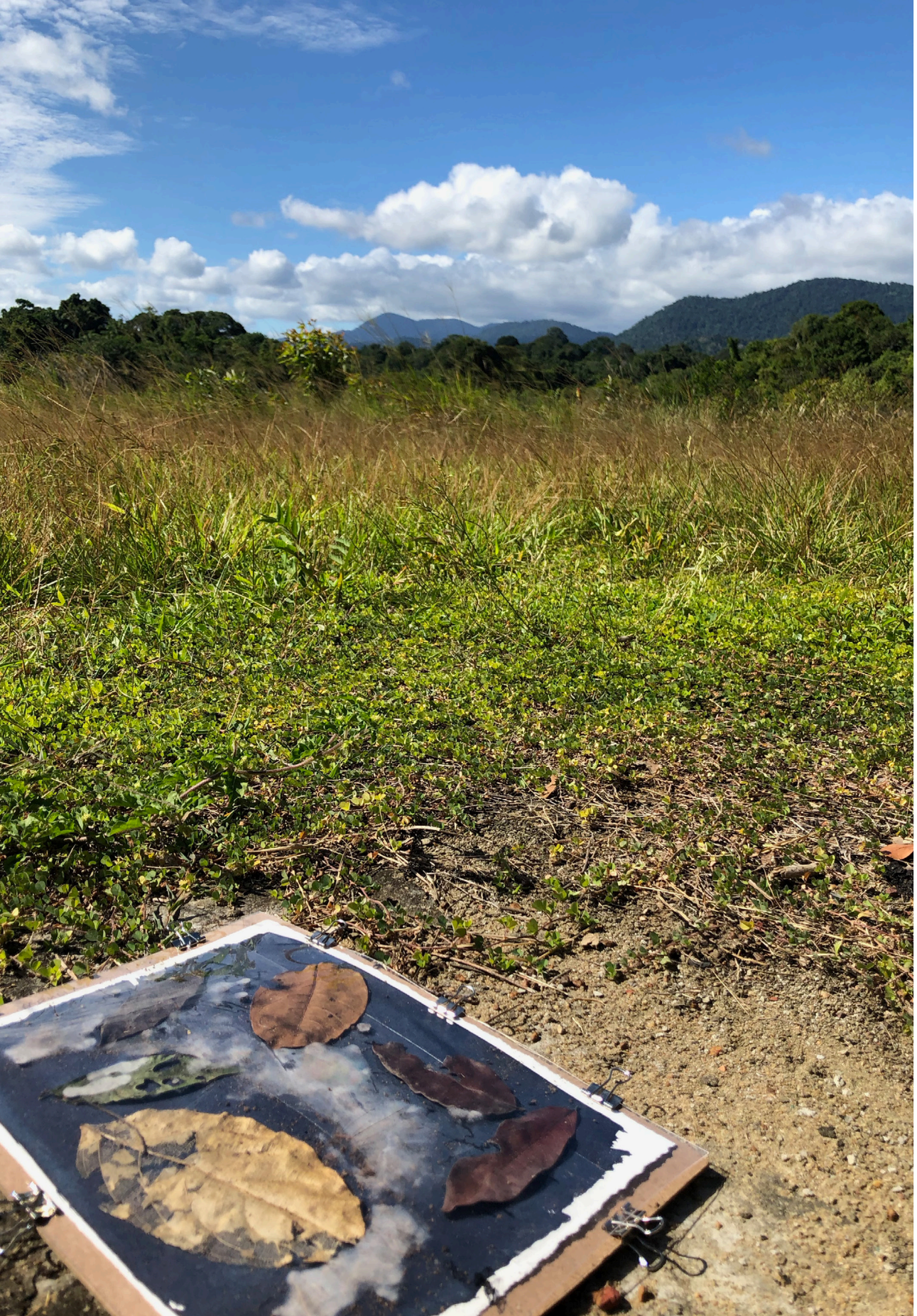
5 Arthur Johnson, "GEO 511: Week 1: Introduction to Soils" (Geology 511, University of Pennsylvania, January 2013).

6 Bruce James in Alexandra Toland, Jay S. Noller, and Gerd Wessolek, eds., *Field to Palette: Dialogues on Soil and Art in the Anthropocene,* p. 277 (Boca Raton: CRC Press, Taylor & Francis Group, 2019).

that I learned that the sinking feeling I experienced when walking on the salt marsh shouldn't have happened. While out in the marsh during low tide one day, a restoration ecologist pointed out the "swiss cheese" texture of the soil at the marsh edge. He explained how increased urbanization is essentially fencing marshes into rising sea levels, leaving the marshes with nowhere to migrate into. Stooping down, I could see the soil layer suspended with roots dangling down, not quite reaching the sand below. For the first time I was able to see "under" the soil and visualize the marsh degradation (*fig. 1*). If I had been walking carefully before, my return was on tiptoes, gingerly stepping over this complex (and overly saturated) ecosystem.

In my recent work, I have benefitted from both the knowledge and generosity of researchers and the ability to physically spend time on these marshes; however, not everyone has the time, inclination, or means to experience a salt marsh in such a hands-on way. It is here that I believe art plays a valuable role in translating the on-site experiences, sensations, and subsequent knowledge into in-gallery explorations. At this point in the climate crisis, it is not enough to generate an emotional response (although an emotional response is inherently part of the experience of place), one must also encourage further inquiry into these systems. My intention with this body of work is to reflect both the complexity and resilience of these soils, and generate enthusiasm for their preservation.

Opposite page: *Fig. 1*: Marsh edge, Jacob's Point, Warren, RI



PRINTMAKING & THE FIELD

The lineage of artists who have worked with soils (either as subject matter or as material) is extensive. Throughout history many visual artists, poets, writers, musicians and performers have turned to soil as a source of inspiration or collaborator. In 2019, Alexandra Toland published, *Field to Palette: Dialogues on Soil and Art in the Anthropocene,* an impressive tome that includes interviews with over fifty artists and just as many soil scientists. The publication captures the impressive array of approaches to soil science in contemporary art. Some artists, like painter Ulrike Arnold, approach soil in a directly physical way, using soils as pigments or sculptural elements. Others manipulate the functions of soils as a substrate for growth to comment on food systems and community health. In her installation *Wheatfield—A Confrontation*, Agnes Denes "reclaimed" an abandoned lot in New York City, planting a wheat field in its place. Growing and harvesting the wheat was a community endeavor. The waving grains of wheat juxtaposed against the New York City skyline were a visual reminder of food cycles and the resources paved over in urban settings.[1]

For many artists, creating this work requires collaboration with community organizations, government offices and especially scientists. Toland's book presents

1 Alexandra Toland, Jay S. Noller, and Gerd Wessolek, eds., *Field to Palette: Dialogues on Soil and Art in the Anthropocene,* pp. 8-18 (Boca Raton: CRC Press, Taylor & Francis Group, 2019).

Opposite page: Exposing cyanotypes in Surama Village, Guyana.

a rare opportunity to hear the voices of both artists and scientists in these collaborations. For her exhibit at the Museum of Arts and Design in New York City, Margaret Boozer sought out Dr. Richard Shaw, New Jersey State Soil Scientist, as a collaborator. On a chance visit to the storage room in Shaw's office, Boozer caught sight of soil survey correlation boxes and the idea for *Correlation Drawing/ Drawing Correlations* was born.[2] The resulting installation is a huge platform of plexiglass boxes each containing a distinct soil sampled from the city. The vast expanse of varied colors and textures presents an elegant solution to visualizing the beauty of urban soil.

This relationship between art and science is not new. Especially within the natural sciences, observational drawing has long been an essential aspect of field research. The field notebooks of Charles Darwin, Merriweather Lewis, Linnaeus Lapland, are noteable examples of the ways in which early naturalists and field researchers documened observations through both text and illustration.[3] Some field notebooks are meticulously factual and methodical, following established systems of documentation; while others are more expressive and capture a personal memory of the day. Often, these records are a blend of scientific fact and personal narrative. Carrying a notebook or sketchbook into the field is also inherent to many artistic practices (*fig. 2*). While the final output created from these documents may be vastly different, the practice of recording thoughts, movements, shapes, and colors through drawing and text is essential to both artist and scientist.

In addition to field notebooks, many "artistic" processes are used in the field for data collection purposes. Ecologist Nalini Nadkarni uses tiny brushes tied to the ends of tree branches to record the contact between branch-end and paper-surface in two minute "paintings". The measured and numbered brush strokes act as both scientific record and abstract representation of tree movement.[4] For Nadkarni, emotional connection with the research object is as important as the research itself. In addition to the tree paintings, Nadkarni references poetry as a means of generating non-science emotional investment in trees and nature. In her work and the work of others, the arts provide an outlet and language for conveying passion, curiosity and respect that is necessarily absent from scholarly publications, yet ever-present in the lab and the field.[5]

Certain printmaking processes also have their roots in scientific research and naturalist studies. Early "photographic" documentation of plant specimens were generated through cyanotype (a photographic print process that results in brilliant blue images). The cyanotype process was invented by Sir John Herschel in 1842. By 1843 British botanist Anna Atkins had published many fascicles of cyanotyped algae. Over the course of ten years, Atkins collected and exposed algae onto a light-sensitive cyanotype coating, creating a direct record of 398 specimens.[6] (*fig. 3*) The final work *Photographs of British Algae* presents three volumes of cyanotype specimens accompanied by handwritten text. While Atkins is considered more artist than scientist, *Photographs of British Algae* is notable in both fields: as a comprehensive catalogue of algae, and as a technically masterful and

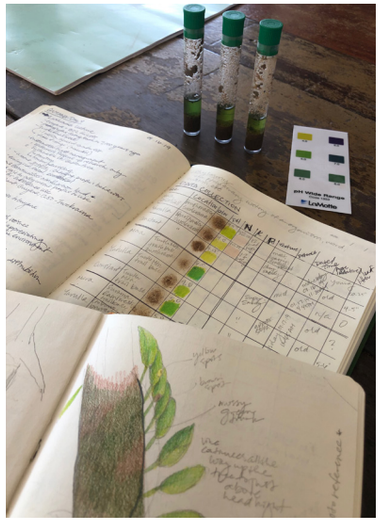


Fig. 2: Artist's field notebook and research notebook from a research course in Surama Village, Guyana

2 Toland, Noller, and Wessolek, *Field to Palette*, pp. 185-192

3 Michael Canfield, *Field Notes on Science & Nature*, pp 2-13 (Cambridge, Massachuesetts: Harvard University Press, 2011).

4 Nalini M Nadkarni, "Portrait as a Young Sapling: Trees as Artists and Mobile Entities," *Terry** (blog), November 2, 2006, http://www.terry.ubc.ca/index.php/category/literary-bonanza/.

5 Nalini M Nadkarni, "Green I Love You Green," *Poetry* 196, no. 4 (August 2010): 343–45.

6 Hope Saska, "Anna Atkins: Photographs of British Algae," *Bulletin of the Detroit Institute of Arts* 84, no. 1–4 (March 1, 2010): 8–15, https://doi.org/10.1086/DIA23183243.

Fig. 3: Spencer Collection, The New York Public Library. (1849-11 - 1850-06). Dictyota dichotoma, in the young state; and in fruit. Retrieved from http://digitalcollections.nypl.org/items/510d47d9-4adb-a3d9-e040-e00a18064a99

artistically sophisticated representation of the natural world.

Within the contemporary context, printmaking—with its inherent multiplicity and mediation—is particularly well-suited to creative inquiry into complex systems such as soil systems. Sarah Suzuki, in her 2011 essay examining the role of printmaking in the contemporary art world, speaks about the malleability of printmaking, its ability to extend into new domains, and its inclusion of multiple materials.[7] These attributes of openness and experimentation make the medium well suited to integration with the sciences.

Within the printmaking umbrella, each process (relief, etching, lithography, etc.) affords different ways of capturing and expressing complex systems, patterns, and site-specific visuals. These processes are also well-suited to on-site image-making. Direct sketching methods can be used on woodblocks for relief printing, copper plates for intaglio printing, and transparencies for screen printing. Cyanotype and other camera-less photography processes can capture the size and shape of vegetation, rocks, or soil particles. Environmental textures can be recorded through collographs or rubbings (later translated into screen prints). Colorways can be planned with the help of color swatches, isolating and matching natural colors for use in eventual printed images. Using artistic processes for these on-site observations allows for the notation of things that may be considered irrelevant to scientific research yet are an essential part of the environment.

Amanda Thompson is one such artist and researcher who uses printmaking as one of many mediums to translate experiences of place into new viewer experiences. Her multi-media work, *Dead Amongst the Living*, was developed through a series of walks among Scots pines in Abernathy forest. Thompson's research was supported by the Forestry Commission Scotland and the University of the Highlands and Islands, and consisted of repeated walks (often in the company of other researchers) while in search of dead trees. These walks and the subsequent findings were recorded through sketches, photos, GPS "walkDrawings", and naturally etched metal plates.[8] Selections of these recordings were then compiled into *Fieldguide*, an artist book. Thomson's book unfolds in a variety of ways—at times revealing and then concealing information—and creates a reader experience that is closely parallel to her scientific research experience. Thomson argues that "art can make an important contribution to [scientific] debates and discussions through the multiple forms it can take, its non-linearity, and its ability to create often (though not always) wordless explorations of place that allow for the insertion of imagination and through providing alternative ways of encountering, experiencing, and responding to these complexities."[9] On their own each element of *Dead Amongst the Living*—print, artist book, video and sound work—captures only one sensation from the walk. Combined, the pieces recreate a journey that is both informational and evocative.[10]

In my own work, I use print works—especially installations and artist books—as objects that can stand in the gap between a "science" and "non-science" realm. Printmaking is an inherently mediated artform. The final print is always

7 Sarah Suzuki, "Print People: A Brief Taxonomy of Contemporary Printmaking," *Art Journal* 70, no. 4 (December 2011): 6–25, https://doi.org/10.1080/00043249.2011.10791069.

8 Amanda Thomson, "Making a Place: Art and a Multi-Modal, Multi-Disciplinary Approach," in *Perspectives on Contemporary Printmaking: Critical Writing Since 1986* (Altrincham Street, Manchester: Manchester University Press, 2018), 318–26.

9 Thomson, "Making a Place: Art and a Multi-Modal, Multi-Disciplinary Approach."

10 Amanda Thomson, "Making a Place: Art, Writing, and More-than-Textual Approach," *Geographical Review* 103, no. 2 (April 2013): 244–55, https://doi.org/10.1111/gere.12014.

a translation of the original mark on the matrix. Print installations in particular afford opportunities to visualize environmental complexity and stimulate imaginative and emotional responses.[11] Installations situate the viewer within the work, requiring physical engagement and forcing the viewer to reconsider their relationship to the space.[12] Through artwork, familiar visuals can be abstracted to reveal new perspectives, and abstract concepts can find visual form.

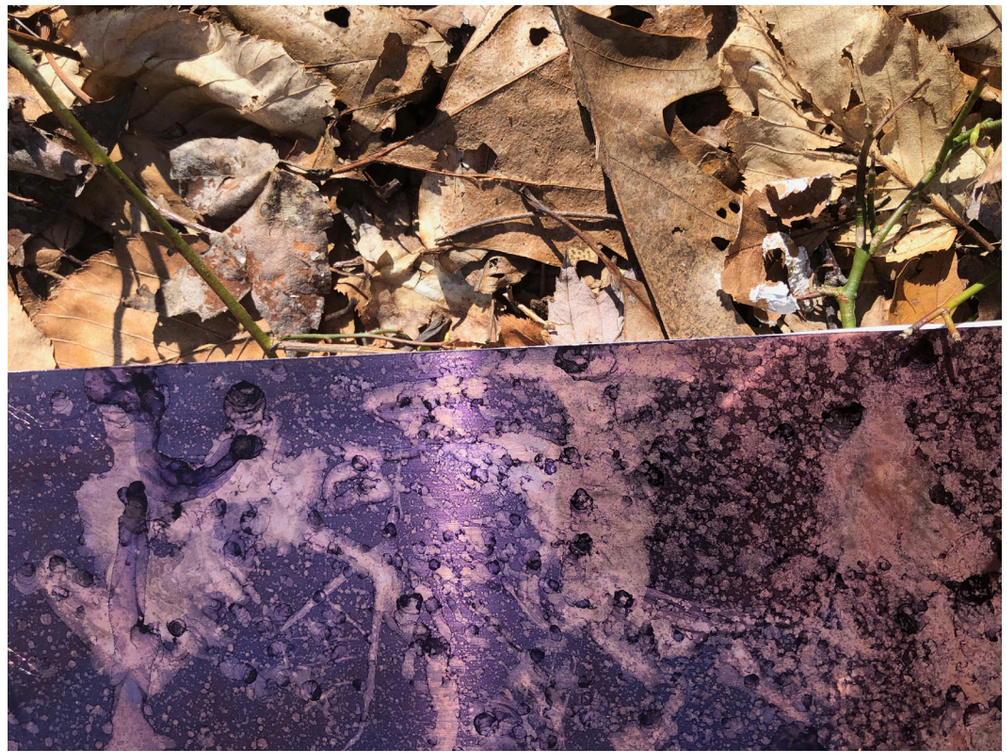
When I'm in the field, I find myself constantly asking, "Can I print with that? What mark could that make on paper?" In some instances, this leads me to directly capturing natural forms through cyanotype or texture through rubbings. In other cases, I am able to capture an intangible process—such as water movement—through the rusting of steel plates. I have packed cyanotype paper into light protective cases for international flights and carried screens, copper plates (even litho stones) out into the field all in an attempt to better capture a natural mark in print. (*fig. 4 & 5*)

Printmaking processes as a mediator between the natural world and the man-made world have proved to be an ideal way to visualize below-ground complexities. The various formats a print may take—2D print, installation, artist book, etc.—afford multiple opportunities for interaction. Through printmaking, I am able to invite the viewer to explore the artworks themselves and, by extension, the soils and ecosystems that inspired them.

11 Lissy Goralnik et al., "Arts and Humanities Inquiry in the Long-Term Ecological Research Network: Empathy, Relationships, and Interdisciplinary Collaborations," *Journal of Environmental Studies and Sciences* 7, no. 2 (June 2017): 361–73, https://doi.org/10.1007/s13412-016-0415-4.; Harriet Hawkins and Anja Kanngieser, "Artful Climate Change Communication: Overcoming Abstractions, Insensibilities, and Distances," *Wiley Interdisciplinary Reviews: Climate Change* 8, no. 5 (September 2017): e472, https://doi.org/10.1002/wcc.472.

12 Claire Bishop, *Installation Art: A Critical History* (New York: Routledge, 2005).

Opposite page: *Fig. 4*: Drawing on a specially prepared copper plate in Lincoln Woods State Park, Lincoln, RI; *Fig. 5:* Pantone color swatches and field notebook, two of my favorite (and easiest to carry) mark-making tools



Patterns Underground (detail), assemblage of collograph and screen prints on laser-cut paper, 129 inches x 65 inches

COMPLEXITY & PLAY

It is the nature of soil to be highly complex and variable, to conform very inexactly to human conclusions and rules. It is itself a pattern of inexhaustible intricacy, and so it is easily damaged by the imposition of alien patterns. Out of the random grammar and lexicon of possibilities—geological, topographical, climatological, biological—the soil of any place makes its own peculiar and inevitable sense. It makes an order, a pattern of forms, kinds and processes, that includes any number of offsets and variables

-Wendell Berry, *Standing on Earth*

Upon moving to Rhode Island in August 2018, I spent time exploring Lincoln Woods State Park. After spending ten years in Philadelphia, PA, I missed the wiggly gneiss and schist formations of my beloved Wissahickon Valley. In Lincoln Woods, I found comfort in the new growth forests and the rock outcroppings with their networks of quartz veins.

At the time, I was thinking a lot about the definition of soils in *The Nature and Properties of Soils*, which defines soils as: "dynamic natural bodies having properties derived from the combined effects of climate and biotic activities, as modified by topography, acting on parent materials over periods of time".[1] As I moved through the woods (mostly running, sometimes walking, sometimes sliding over rocks), I observed the trees and their roots snaking over the ground. I listened to water trickling through rivulets. I felt the slopes burn my thighs on the uphill and my calves on the down hill, and I wondered: How do all these things fit together?

1 Nyle C. Brady and Ray R. Weil, *The Nature and Properties of Soils*, 13th ed., p. 40 (Upper Saddle River, NJ: Prentice Hall, 2002).

My attempt to answer that question took the very literal form of puzzles. In an early attempt to visualize the diversity and complexity of these belowground systems, I created a varied edition of twenty-four screen prints and laser cut them into thirteen pieces each. The resulting pieces were then puzzled together into a large patterned paper tapestry. (*fig. 6*)

Patterns Underground represents the subtle, yet significant ways in which the elements of bedrock, vegetation, time, topography, and climate can interact to create different soil profiles within a larger landscape. The overall pattern appears unified and continuous, yet every 17" x 17" unit within the tapestry is completely distinct. Completing *Patterns Underground* allowed me to work through some of the logistical challenges of designing a visually interesting and sufficiently complex puzzle. The next challenge became creating a puzzle that others could participate in and was more directly related to the specifics of the landscape I was working on.

In an effort to more closely represent the landscape, I started bringing a running pack stuffed with a field notebook and pantone color swatches on my weekly trips to Lincoln Woods. Soon I was bringing as many artistic processes into the field as possible. I used rubbings to capture natural textures, and direct screen print and cyanotype exposures to record size and shape of soil particles and leaf litter. I collected small soil samples and photographed them under a microscope. At one point, I even brought a 20" x 20" copper plate prepped with a special ground out into the field and created the image for an etching. Paired with a basic knowledge of basic soil science, these observations afforded me a visual vocabulary with which to explore the soil system of Lincoln Woods.

The resulting artwork, *Small Changes We Make*, consists of seven distinct print editions and an interactive puzzle. (*fig. 7 & 8*) The prints serve as an index of the colors, shapes, and textures (organic and inorganic) of the site. Each print employs a different technique or process, and represents an aspect of both the soil system and on-site experience. The visual variety is directly related to the variety of on-site activity. The accompanying puzzle further translates field experience by inviting the viewer into activities that parallel on-site artist-researcher actions: close looking, engagement with the ground plane, and physical movement of information. The puzzle facilitates constant problem-solving and engagement

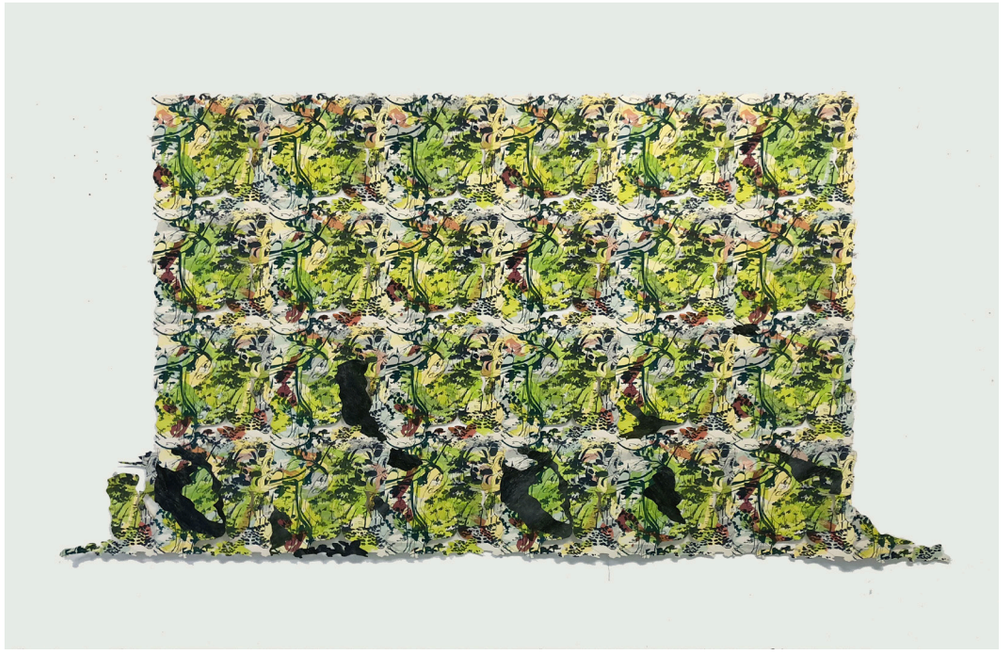


Fig. 6: Patterns Underground, assemblage of collograph and screen prints on laser-cut paper, 129 inches x 65 inches,

Fig. 7: *Small Changes We Make*, installation of seven prints and an interactive puzzle (screen print, collograph, cyanotype and etching)

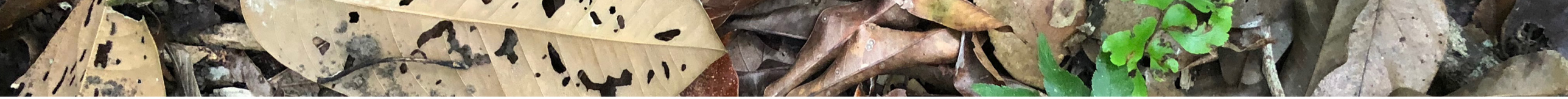
with a complex system that has multiple "solutions". It provides an opportunity to abstractly explore soil systems in a way that requires no prior knowledge of soil science, but simply a willingness to engage in play and puzzling.

In designing *Small Changes We Make*, I intentionally created a puzzle with no right answers. I wanted viewers to constantly move pieces around and seek new visual connections. For some this was a welcome challenge. For others it was a tiresome frustration. Unintentionally, I had recreated the exact same emotions I felt in the field: excitement and frustration. In the abstract sense, I had figured out a way that representations of place could physically fit together, but I had done very little to provide concrete answers to my initial question: How do these things fit together? When it came to the science of soils, I had as many (if not more) questions than when I started.

Perhaps the most effective way to describe my mindset at this point is through a creative writing piece made while researching the relationship between soil pH and dominant tree species in the Guyanese rainforest. This research trip was led by a zoologist and our research was aided by field experts in ornithology and entomology. These experts were incredibly helpful in advising general field activity, but I found my questions about tree species and soil pH met with shrugs. By the end of the trip, I would point to a tree or a vine and jokingly ask, "What's this?" knowing that I would be humored with completely made up name and history.

The experience, while frustrating, was also elating. I had the time and space to simply pile up questions. I returned home with more questions than I started with, and a drive to seek out the people who had answers. The following poem was written after a day of sorting through leaf litter at the base of mora and yarulla trees. I felt like a child in the field—turning leaves over, making observations I didn't have the vocabulary for, and asking "Why?" of everything. In the poem, I tried to playfully express the serious duality of curiosity and frustration. Through it all, the constant promise of something new developing lies just below the surface: There's something there that wasn't there before.

Opposite Page: Fig. 8: *Small Changes We Make* (puzzle detail)



Sometimes, while I'm poking around the base of a tree trunk, a line from that one The Beauty and The Beast song loops in my head. The one Mrs. Potts sings while Beauty and Beast flirtatiously sling snowballs at one another: "Oh yes, there's something there that wasn't there before."

Mrs. Potts on the balcony nods knowingly to Chipp as they watch me slowly sifting through soil at the base of this Mora tree... or is it a Silk Cotton tree? We've got some nice buttressing going on here. Mora-quality nice. Probably a Mora, but is Mora bark always that flaky?

Oh yes, there's something there that wasn't there before.

Could be Tatabu. Says here, "Sapwood is weakly cucumber-scented". But Amorata is also cucumber-scented. Why do so many trees smell like cucumber? What does weak cucumber even smell like?

There's something there that wasn't there before.

Go with your gut. This is a Mora tree. Just look at those buttressed roots. Mora all the way. Diameter measured at chest height is... too big to measure. Can I write that? Probably not science-y enough. "Exceeds arm span." What's my arm span? Tape measure's too short. How do you quantify something you don't have the tools to measure?

There's something there that wasn't there before.

Comparatively, this is smaller than the Mora I documented yesterday, but definitely larger than 60" in diameter. Vague, but I'll have to roll with that gap in my data. Litter depth though... a confident two inches. Mainly composed of these broad, ovoid, waxy leaves. Ovoid—that's good. Very formal. And we got some tiny leaves; some jagged-y edge leaves; some crispy, crunchy leaves. There's got to be a better way to describe litter content. What's the vocabulary one would use to talk about decaying leaves?

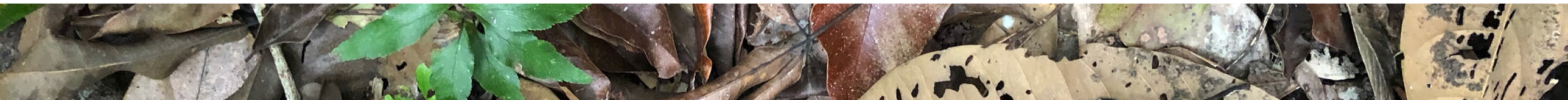
Oh yes, there's something there that wasn't there before.

Litter decomposition rates and soil respiration. That would be good data to have, if I knew how to collect it, but I don't. So leaf litter composed of four types of leaves at the base of a way-too-big-to-measure Mora tree on sandy soil. Moderately sandy soil? Kind of sandy soil? How much sand needs to be in a soil to make it qualify as a sandy soil?

There's something there that wasn't there before.

It crumbles into mostly sand, so we're gonna go with moderately sandy soil. Makes sense for the location, halfway between riverbank and savannah edge. A mora tree in moderately sandy soil with some broad-leafed ferns, and wispy-thin grasses, and a heart-shaped ground vine, and another ground vine with leafy triplets that might actually be a tree vine. WHAT ARE THESE PLANTS? I'm just digging up questions over here. Just question upon question, upon question.

There's something there that wasn't there before.



OBSERVATION & CARE

Geomorphology, understanding how landscape evolves and changes over time is like art—a somewhat aesthetic and visual mode of inquiry. Both disciplines rely on an important key skill: observation. A keenness of eye and an attention to detail are essential attributes for both disciplines. Looking at the same features in slightly different ways provides an important synergy between artist and scientist, enabling a productive exchange of ideas.

-Alexandra Toland, *Field to Palette*

In late spring 2019, I embarked on my next print-soil exploration determined to get answers to the questions I had amassed. With salt marshes as my new point of interest, the number of local researchers were plentiful. Salt marshes are studied by soil scientists, restoration ecologists, ornithologists, and many others, and I found these researchers generously willing to speak with me.

Armed with my artistic observational toolkit (field notebook, Pantone color swatches, voice recorder, etc.), I set out with the goal of learning as much about the salt marshes as I could in one summer. Some information was gleaned through lab visits, publications, and presentations, but the most valuable insights came from field experiences alongside these scientists. At Jacob's Point, Warren, RI, I carried equipment and observed the process of soil coring with soil scientists (*fig. 9)*; and recorded band numbers, weight, age and sex for Salt Marsh Sparrows with researchers from the Salt Marsh Sparrow Research Initiative. I practiced vegetation

Opposite page: *fig. 8*: Examining a soil core at Jacob's Point, Warren, RI

fig. 10 & 11: Estimating vegetation density and root depth at Quonochontaug Pond, RI

density observation with a restoration ecologist at Quonochontaug Pond, RI (*fig. 10 & 11*), and assisted with planting *spartina patens* and *spartina alterniflora* seedlings at Ninigret Pond restoration site in Charlestown, RI. Each of these experiences provided an informational foil to the artistic record I was creating.

More importantly, these experiences began to open my eyes to the ways in which humans interact with these spaces. In accompanying these experts into the field, I watched ecological care in action. On my first day of volunteering with Salt Marsh Research Initiative I was told to "look for the friendly face with glasses and unruly white hair" of the co-founder. Deirdre's white hair and friendly face were indeed impossible to miss, and her energy at 6AM was impressive. She bounded through the marsh chasing the sparrows into nets while somehow managing to surefootedly avoid the precious nests. Meanwhile, I found it impossible to keep my eyes on the birds, my feet, and the nest markers at the same time. For researchers like Deirdre, their knowledge informs the way they move through the space. Learning alongside them challenged me to move differently as well. When I went back into the field on my own, the tools I took with me, the senses I used, and the things I noticed were all more nuanced for having spent time in their company.

In addition to the Pantone color swatches, I began carrying a Munsell soil chart (a system specifically designed for assessing soil colors) so that I could more accurately match hues above and below ground (*fig. 12*). Sound recordings and rubbings also became an important aspect of documentation. On one occasion, I brought a roll of Tyvek, a litho crayon, and my phone audio recorder into the marsh. Over several hours (punctuated by coffee breaks to escape the body-numbing cold), I made rubbings of close to forty-eight square feet of salt marsh ground surface, and recorded the marsh sounds—rustling grasses, calling birds, and distantly breaking waves—while I worked.

As I spent more time in the marsh with these tools, I found my skills of observation steadily increasing. I became aware of the diversity of both natural and urban sounds while in the marsh, and learned to listen for more than what I expected. Signs of encroaching urbanization were evident in the steady din of construction

Fig. 12: Assessing soil colors with a Munsell soil chart Haile Farm Preserve, Warren, RI

equipment and the roar jet engines intermixed with bird calls. Soil no longer appeared to be hues of slightly more reddish or yellowish brown or grey; there were blues, greens, and even purples beneath the grasses. The grasses themselves became more distinguishable. I slowly learned to differentiate the gentle waves of *spartina patens* from the taller, stockier *spartina alterniflora* at the marsh edge. My lack of interest in the flora all around me—what Wandersee and Schussler call "plant blindness"[1]—turned into respect for the incredible diversity among salt-tolerant plants. On a trip to a salt marsh restoration site with a restoration ecologist, I found myself rejoicing at the sight of several different grasses naturally taking root in the dredged soil. The celebratory mood was enough that if we had thought to pack champagne in the kayak, I would have offered a toast in the grasses' honor.

My heightened sensory and scientific awareness of the marsh brought out a desire to share these experiences with others. *Marsh Senses*, an installation of large quilted cushions and sculptural books, is my attempt at recreating the multisensory marsh experience (*Fig. 13*). As in *Small Changes We Make*, I parsed visual representations of each aspect of the ecosystem out into a variety of textile designs. Different printmaking techniques are used to reference coastal blue carbon storage capacity, geological textures, Salt Marsh Sparrow and mussel populations, root density and native grasses. In quilting these patterned fabrics together, the visual patterns and subtly different tactile qualities become abstract visual representations of a healthy salt marsh soil system.

To further heighten the multisensory viewer experience, I crafted these quilts into cushions stuffed with recycled memory foam and paper. The installation crunches and gives way underfoot, mimicking the unexpected audible and tactile sensation of walking over degrading, over-saturated soil, mussel shells and grasses crunching with every step. In the artist books that accompany the installation, light and motion-activated sound bytes play periodically as the viewer thumbs through this literal record of grasses. My hope is that these audio intrusions startle and delight the viewer in much the same way a Salt Marsh Sparrow might startle a researcher.

1 James H. Wandersee and Elisabeth E. Schussler, "Preventing Plant Blindness," *The American Biology Teacher* 61, no. 2 (1999): 82–86, https://doi.org/10.2307/4450624.

With *Marsh Senses* I hoped to make viewers more aware of their actions in the same way that spending time with scientists in the field had made me aware of mine. Over the course of frequent visits to the marsh, I developed a love and respect for that particular environment, a respect that is reflected in the care with which I treated the creation of these fabric objects. In order to recreate this experience in the gallery, I aimed to create an installation that is paradoxically comfortable and startling; and offers space for reflecting, relaxing, and (of course) puzzling.

Opposite page, Fig. 13: Marsh Senses, temporary installation at Tillinghast Farm, Barrington, RI;

COMMUNITY & GENEROSITY

I believe art can be a practice of talking to and meeting people and building communities. I think we can be a source, hopefully for change. In many ways, artists are problem-solvers. And that's where science and art can come together… to better understand how we function as a society and to help move ourselves forward.

-Matthew Moore, interview in *Field to Palette*

None of the experiences detailed in the previous section would have been possible were it not for the generosity of the science community. Working in the marshes was a never-ending stream of generosity: the Warren Land Conservation Trust offered their lands as study sites and their time for guided walks through the trails; organizers of the National Cooperative Soil Survey (NCSS) offered me a one day pass to their sold out conference so I could sit in on poster presentations; Ace Mattresses donated three mattresses worth of memory foam to fill *Marsh Senses*; and countless scientists and researchers offered to share their time, knowledge and experience. One scientist, in response to my email asking if he had thirty minutes to talk about his work responded with, "Actually, do you have four hours? I'll bring the kayaks."

Recently, the most pressing question in my studio has been, How do I bring some of the generosity and welcoming nature of this community into my artmaking? In

Opposite page: Salt marsh grasses, printed on textiles and in real life; Quonnie Pond, RI.

answering this question, I have taken the two different approaches: on one hand, designing works that invite participants into voluntary acts of care and restoration; and on the other, finding ways to be more transparent about the role of natural processes in my own printmaking process.

Some of the most generative marsh visits were moments when I wasn't there to collect observations or "data" for my own prints, but simply to help. In joining other volunteers to plant grasses or band Salt Marsh Sparrows, the role of community in maintaining these spaces was incredibly clear and I felt appropriately small. In these situations, my actions were entirely dependent on the other volunteers. I dropped young grasses into holes others dug and recorded numbers more skilled birders called out to me. I was glad to have simply been present and taken part (in however small a way) in caring for these systems. Inspired by these experiences, I am eager to incorporate volunteer participation into future artworks in the form of mending textiles. To this end, I am developing an installation of cyanotypes on torn silk that invites volunteers to physically stitch back together images of salt marsh vegetation.

Below, Above (41° 42' 41.93" N, 71° 17' 23.66" W , Spartina patens): etched and naturally corroded steel, 15 in x 11 in

In addition to these thoughts about mending and volunteer activities, I am also revising some printmaking techniques in order to let soil take over more of the mark-making. *Below, Above* is a recent print project that has developed out of burying small steel plates in the marsh for two weeks at a time. These specially prepared plates corrode quickly in the salt-water saturated soils, and become a record of water movement at that particular location *(fig. 14 & 15)*. Collectively they create a "map" of high marsh and low marsh areas and showcase some of the salt marsh plant-soil relationships more elegantly than I have previously been able to. This project feels more like a true "collaboration" with the marsh than any previous project. It is also a test of my relationship with the marsh. Will I be able to find the plates after two weeks? Will I remember this landmark, this particular clump of grasses? Always, the answer is yes. I am getting to know this marsh. As I unearth the steel plates and am greeted by a unique pattern of rust, I experience a jolt of joy: The soil is moving, and its movements are beautiful.

Opposite page: *Fig. 14 & 15:* A sample steel plate before and after being naturally corroded at Jacob's Point, Warren, RI.

Most of the experiences I have detailed in this writing happened while I was alone in the field. Back in the studio, these moments of joy and discovery can be muddled by my hand, by my desire to make something "look good," or the need to add explanation to the mark. By the time I share the experience with the viewer it is often more me than the marsh on the page. In lieu of taking the viewer out into the field with me, I try to mitigate this break in experience by bringing as much of the field sensations into the gallery or viewing space as possible. With my puzzle works, I am delighted to see viewers huddled on the floor discussing placement: "I think this piece fits here… oh, but what if we put it there?" With the box of books that accompanies this writing I hope to share a more intimate, solo experience of the marsh.

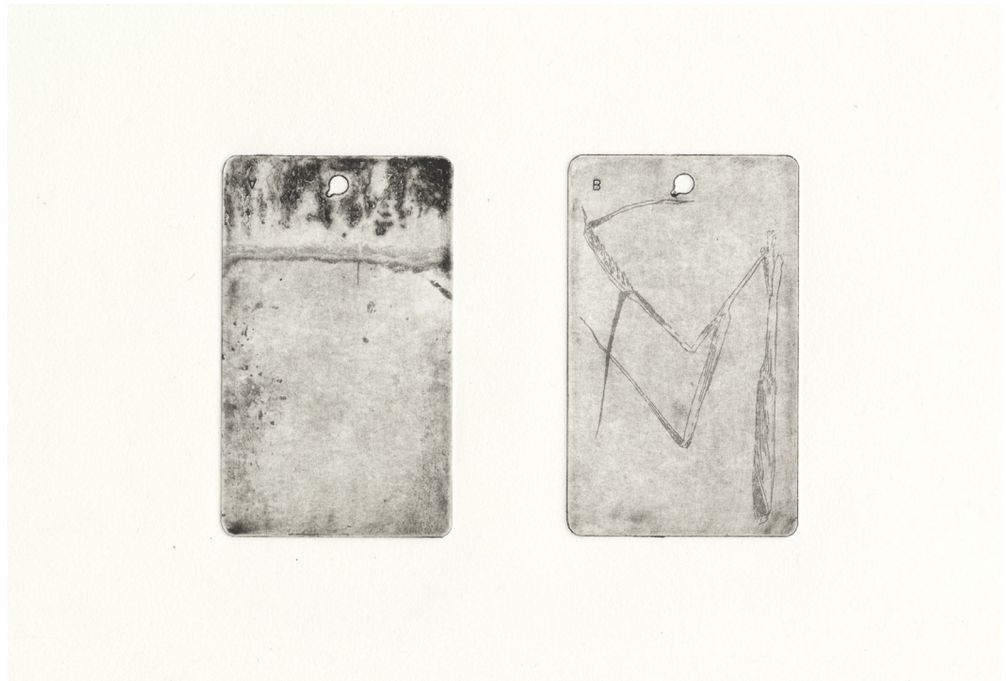
Below, Above (41° 42' 41.75" N, 71° 17' 22.11" W , Iva frutscens): etched and naturally corroded steel, 15 in x 11 in

Each of the books "buried" beneath this text offer a unique reader experience that in some way mimics my movements through the marsh: pulling up steel plates from the soil, gently pushing through grasses to see the marsh surface, and consulting my soil map to locate myself. Much of the text and imagery is sourced from my field notebooks—from a time when I did not know much (if anything) about the marsh—and are a record of my initial questions and observations.

Especially at a time when travel and shared experiences of place are difficult (or impossible), I find artist books to be an ideal way to individually expereience the same narrative. With this collection of books I hope to openly, honestly, and accessibly share my experience of these spaces in much the same way scientists and researchers have shared their knowledge and experience with me.

Below, Above (41° 42' 41.73" N, 71° 17' 14.11" W , Phragmites): etched and naturally corroded steel, 15 in x 11 in

Below, Above (41° 42′ 40.57″ N, 71° 17′ 27.55″ W , Limonium carolinianum): etched and naturally corroded steel, 15 in x 11 in



Below, Above (41° 42′ 41.38″ N, 71° 17′ 26.17″ W , Spartina alterniflora): etched and naturally corroded steel, 15 in x 11 in

Below, Above (41° 42′ 42.27″ N, 71° 17′ 20.19″ W, Distichlis spicata): etched and naturally corroded steel, 15 in x 11 in

Below, Above (41° 42′ 40.8″ N, 71° 17′ 21.3″ W , Baccharia halimifolia): etched and naturally corroded steel, 15 in x 11 in

END NOTE

Salt marsh restoration and preservation efforts often depend on volunteer labor to get the work done. If you are interested in participating in these efforts, I recommend planting grasses at salt marsh restoration sites with Save the Bay or banding and tracking salt marsh sparrow populations with the Salt Marsh Sparrow Research Initiative.

At the very least, if you live in Rhode Island, are visiting the state, or simply passing through, I highly encourage you to take the time to visit your local salt marsh. There are many peppered throughout the urban and suburban landscape of Rhode Island. I promise, you won't have to travel far to find one. When you visit, tread lightly. Revel in the sights, the sounds, and (especially) the smells. Ask questions, and seek out the people who have the answers.

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