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**RETHINKING WATER, PLACE & COMMUNITY**

**PROSPECT**

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from multiple perspectives within and beyond the academy.

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FEATURE

# FLUID IMPRESSIONS: CONNECTING DATA AND STORYTELLING IN IOWA'S WATERSHEDS

By Eric Gidal, Munachim Amah, Javier Espinosa, Richard Frailing, Ellen Oliver, Clara Reynen, and Kaden St Onge

As we contend with the environmental degradation of our waters and the fragmenting of our communities that such degradation both

exhibits and accelerates, we need to draw on the arts and the humanities as much as we do on hydrology, engineering, politics, and law. Alongside



*The authors with Dick Sloane on his farm in Brandon, Iowa. From left to right: Richard Frailing, Javier Espinosa, Ellen Oliver, Kaden St Onge, Munachim Amah, Dick Sloane, Clara Reynen, Eric Gidal. Image courtesy of Kate Giannini.*

work in environmental engineering, hydrosciences, community organizing, and political advocacy, the humanities and the arts can provide needed perspectives to help imagine new forms by which our present situation may be more fully understood and through which possible solutions may be conceived. In her introduction to a special issue of *Resilience* devoted to models of Green Humanities Labs, Joni Adamson makes a case for integrating the environmental humanities into cross-disciplinary research with a goal not only of communicating, but of generating knowledge and perspectives. “Can the humanities,” she asks, “catalyze imagining of new ideas, narratives, frameworks, alternatives, demands, and projects that will enable people to envision plausibly different, even livable, futures?”<sup>[1]</sup> To do so, writes Sally L. Kitsch, in another contribution to the same issue, humanists must think of themselves “as generative and future oriented... as solution (or approach) proposers rather than as critics and problem multipliers.”<sup>[2]</sup> They must seek ways to build, in Michael Simeone’s words, “a framework for participation to supplement critique.”<sup>[3]</sup> Adamson, Kitsch, and Simeone extend ideas articulated by Doris Sommer in her book *The Work of Art in the World: Civic Agency and Public Humanities*, in which she seeks “to link interpretation to engaged arts and thereby to refresh a civic vocation in humanistic education.”<sup>[4]</sup> Sommer, who directs the Cultural Agents program at Harvard University, makes a strong case for the public role of aesthetic production and suggests that “democratic life depends on the dynamic between art-making and humanistic interpretation.”<sup>[5]</sup> These mandates apply as much to efforts in environmental renovation as they do to social and cultural revival and suggest how the arts and humanities can contribute to work at “the intersections between biophysical systems and human systems,” to cite the mandate of this journal. This is a story about one such effort.

For 10 weeks in the summer of 2023, six early career scholars, writers, and artists from the

University of Iowa gathered to learn about the problems of nitrogen pollution in Iowa waterways and to create content for the Blue Green Action Platform, a communication and knowledge platform that seeks to empower people through storytelling and accessible water quality information. Nitrogen pollution is an indirect consequence of the plowing and draining of the tall-grass prairie that used to cover Iowa’s lands. The conversion of prairie to farmland by nineteenth-century Euro-American settlers led to soil erosion and the elimination of natural water filtration. Deep-rooted prairie ecosystems were replaced with annual crops while streams and rivers were channeled to free up more land for cultivation. In the post-war years, as the production of nitrogen for ammunition converted to the production of nitrogen-based fertilizer, farmers were encouraged to apply increasing amounts of chemicals to their lands to meet growing demand. In the wake of the farm crisis of the 1970s and 1980s, which depopulated many rural communities and concentrated land ownership in the hands of fewer but larger operations, the problems only intensified, separating crop production from livestock farming and encouraging amplification of both.<sup>[6]</sup> The increased gathering of livestock into CAFOs (Concentrated Animal Feeding Operations) produces far more manure than can be absorbed by the corn and soybean fields that dominate the state, fields already saturated with anhydrous ammonia (NH<sub>3</sub>). As the ammonia and urea fertilizers spread on farmer’s fields are converted to water-soluble nitrate through soil bacteria, the nitrate leeches into streams and rivers where it creates harmful algal blooms. These algal blooms deplete oxygen throughout the Mississippi River watershed all the way to the Gulf of Mexico where a hypoxic “Dead Zone” stretches for 6000 to 7,000 square miles. Regulations put into place by the Clean Water Act intentionally exempt agriculture as a “non-point source” pollutant, even as the intricate system of drainage tiles and ditches that enable large scale farming operations make such categorization hard to defend.<sup>[7]</sup> Iowa’s streams

contain some of the highest concentrations of nitrogen and phosphorus in the nation and Iowa contributes an average of 29 percent of the long-term nitrate load to the Mississippi-Atchafalaya basin and into the Gulf of Mexico.[8]

The Blue Green Action Platform—BlueGAP for short—seeks to help communities reduce nitrogen pollution by sharing data and stories across different watersheds. This work was funded by a two-year National Science Foundation (NSF) Convergence Accelerator grant, one of a number of grants offered to projects that combine cross-disciplinary approaches to social problems with an emphasis on tangible solutions. With a motto of Data + Stories = Action, BlueGAP connects community organizers, scientists, engineers, and concerned citizens in Iowa, Florida, and the U.S. Virgin Islands (USVI). The BlueGAP Information System provides reliable, up-to-date information on nitrogen loads in different waterways while establishing channels of communication and models for individual and collective action. The platform features interviews and educational videos to highlight the work of water quality champions in Iowa, in Florida, and in the USVI—individuals and organizations who are working to promote best practices and to organize communities adversely affected by nitrogen pollution. And, thanks to the work detailed below, the platform also shares stories through more experimental forms that use different media and different perspectives to give expression to the problem of nitrogen pollution in our communities.

Eric Gidal, a professor of English at the University of Iowa, gathered two consecutive teams of students from graduate programs in the arts and humanities at the University of Iowa to produce creative content for the platform. Gidal's scholarly expertise is in eighteenth- and nineteenth-century British literature with an emphasis on the intersections of literary and environmental histories. The students he gathered for the summer of 2023, all co-authors

on this article, came from programs in book arts, ceramics, choreography, creative nonfiction writing, English literary studies, journalism, and library sciences. Gidal collaborated with David Cwiertny, a professor of civil and environmental engineering at Iowa and research engineer at IIHR—Hydroscience and Engineering (IIHR), and Kate Giannini, a program manager at IIHR. Cwiertny serves as the University of Iowa lead and Giannini helped foster boots-on-the-ground connections with individuals and communities across different watersheds, leveraging IIHR's expertise and position as a trusted and reliable resource for understanding Iowa's complex water-related challenges. Together, they designed an educational program for the students built around interactions with university and community partners. During the initial weeks of the project, the student team traveled around eastern Iowa to learn about its river systems and the different people and organizations who work to sustain and protect them. They met with farmers to learn about riparian buffers, prairie strips, cover crops, and no-till agriculture, which decrease the need for nitrogen fertilizers, improve soil quality, and filter the waters that pass through cultivated lands. They toured water treatment facilities and met with stormwater managers and civil engineers, appreciating how urban areas seek to minimize their own impacts on water quality while expending great efforts—and money—to reduce nitrates and other contaminants from the water supply. And they met with community organizers who work to address not only water quality, but the social and economic inequities of our industrialized agricultural systems. Nitrogen pollution, they came to understand, is symptomatic of many structural imbalances in modern industrial societies.

The challenge was to capture these connections in the various stories they assembled and the forms that they created. From the beginning, the students in the summer program took on active roles: interviewing community members, pitching in at volunteer farms and food banks, trying

to understand the human as well as chemical dynamics of nitrogen pollution throughout the state. Their projects moved between different perspectives and different scales, approaching one-on-one interviews through a wide lens, blending

photography with drone footage, journalism with creative writing, archival research with visual and material arts. These different scales and media help situate stories—and water—within intersecting economic and ecological dynamics.

## Our Stories

### Photo Essay

Munachim Amah is a doctoral student in journalism and mass communication. He produced a modular photo essay built around the question of “Home,” a topic Munachim has been preoccupied with in his creative and journalistic work over the past few years. As a Nigerian man whose family moved around a lot during his childhood and who now finds himself in a new country, he often feels unanchored, adrift, and especially sensitive to the question of belonging: Who belongs to a place and why? How does a place become home? As Warsan Shire writes in her poem “Home” (2009), home may be a place one must flee, a place one dares not return to: “I want to go home / but home is the mouth of a shark / home is the barrel of the gun.”[9] This imagery of home as a destructive and propulsive force resonates deeply with Munachim who has had to leave his country in search of a more rooted and peaceful life.

The particular idea for his modular photo essay, which explores how farmers and residents in Iowa’s watershed communities come to call those places home, emerged during an event the team attended in Dyersville, Iowa in the second week of the summer project. Dyersville was awarded the River Town of the Year title by the nonprofit advocacy group Iowa Rivers Revival in honor of their efforts toward wetland restoration and water quality improvement. In Dyersville, the students had the opportunity to collaborate with Impact 7G (now part of the Eocene Environmental Group), an environmental planning company, to collect stories from event attendees. Munachim spoke with many people that day; however, one conversation stayed with him, a conversation

with Robin Fortney, an environmental educator and advocate who asked him a question that both surprised and intrigued him: “And what is your relationship with water?” He had not been prepared for this question and did not know what to say, but the question taught him that collecting stories is an active dialogue; people wanted to know why he was doing what he was doing, and people were eager to hear his story while sharing their own. The people he talked to also celebrated farmers and community organizers who were doing inspiring work in managing nitrogen pollution in Iowa. This informed the celebratory tone of his contribution.

The product is, consequently, a photo essay and accompanying mini-profiles of Iowa farmers and activists. The profiles are in conversation with Munachim’s own reflections. Collectively, this content blurs the lines between journalism, photojournalism, creative nonfiction, and poetry. By including himself in the portraits, Munachim provides a model for potential users of the BlueGAP platform who will need to reflect on connections between the people and water in their communities and on their own experiences of water, care, and home. This experimental approach aligns well with BlueGAP’s mission to integrate data and stories to improve nitrogen management and focuses on making people feel something, experience something, and thus be inspired to do something.

## where is home?



*The sun sets in the neighborhood in Lagos, Nigeria, where the writer lived between October 2018 and August 2021. Photo: Munachim Amah*

I am from Nigeria. I lived thirty-two years of my life in Nigeria. I lived in small towns in southeastern Nigeria and then I lived in a large city thousands of miles away from where I grew up and then two years ago I moved to Iowa for graduate school and quite honestly I don't know where my life will take me from here.

I have been on the move all my life, I have never settled anywhere, I have never called anywhere home, and this is not without reason. Before I turned eight, my mother died of breast cancer. Before I turned nine, my family had lived in five different places. My father married my stepmother when I was eleven, and I attended eight schools between elementary and high school. There was so much change, so much disruption in my childhood.

After attending one of my high schools for four years, and with only one year left to finish my high school education, I went home one summer and my father said I was not going back to my school. "You're going to a new school in September," he said. He bought me new books, new uniforms, a new bed, a new lamp, a new set of cutlery, new plates, new buckets, a new cupboard. I did not say goodbye to my friends and teachers. I did not go back to my school to retrieve my belongings.

Disappearing from a place like that leaves you with a convoluted sense of the value of human beings and possessions. I have never lived in a place for more than three years. I have never been in a romantic relationship for more than two years. I do not have any childhood friends. I do not feel deeply connected to my family. As an adult, now, I am not a stranger to living on the go.

Disruption is baked into the core of who I am, so when I ask myself the question "where is home?" I do not know what the answer is. Is home my father and my sisters and my brother and my stepmother scattered in different parts of Nigeria and the world? Is home my father's ancestral hometown that I visited once in two years for a couple of days during my childhood? Is home one of the countless places I lived during my childhood, teenage, and adult years? Is home my apartment in Iowa City where I currently live, the community of people in my graduate program, my small circle of friends?

In talking to people who feel some connection to places in Iowa, I wanted to understand what connects them to these places. What is it about a place that grounds them, that makes them feel they are home?

Two of the farmers I talked to have farmed and lived on their lands for over a quarter of a century. Another farmer has farmed a small piece of land for half a decade. I talked to a woman who moved to Des Moines in the early 1980s and lost her husband to a terminal illness, and when her family asked if she wanted to move back to Illinois, she said no. In her grief, she found a passion, a love for rivers and streams. She has lived in Des Moines for more than four decades and now calls Iowa home.



*"Home" presentation poster by Munachim Amah.  
Images and text courtesy of Munachim Amah.*



## Where the treasures are



Robin Fortney talks about her passion for moving water at Walnut Woods State Park, Des Moines. Photo: Munachim Amah

**R**obin Fortney, born on the East Coast and now living in Walnut Creek watershed in Des Moines, has always loved moving water.

As a child, Fortney visited her grandmother in Tidewater Virginia on the Rappahannock River near Tappahannock Virginia, an estuary that was tidal and brackish. She would go down into the river through a ravine and walk barefoot through gum balls, and she would spend all day in water, hiking up and down the beach, looking for treasures.

One day, when Fortney was nine and had received a Girl Scout knife, she was running her hand over a clay bank that was about her height when she felt a bump.

"It's hard," Fortney said. "I look at it, and it's bony kind of, and I start scraping away the clay and it keeps unfolding."

What Fortney found that day was a giant shark tooth, which she said the Smithsonian in DC confirmed to be the tooth of the megalodon, the largest shark that ever lived.

Fortney said discovering that tooth opened up something in her. It made her incredibly curious about her environment.

Fortney has found many items from previous cultures in her exploration, like clay pipes, iron ingots, animal fossils. When she was a child, she would put these treasures on the little two by four ledges on her grandmother's screen porch. Now, she collects them in her home in Des Moines, by Walnut Creek.

"There's mystery," Fortney said. "You don't know what's going to be around in the next corner."

It's why Fortney feels very protective of Iowa's rivers and streams and wants people to care a little more about what happens to them.

"How we manage the land, how we live with the land, will affect how much water we have," Fortney said. "We are water. No matter where we live, we have to have water. Whatever you discharge will go into a stream that then someone else gets to drink. So it's kind of a neighborly thing to think about what you're sending downstream."

"This world isn't just about us," Fortney said. "We're not the only ones here."

## "Bloom where you're planted"

**O**riginally from Alabama, Shaffer Ridgeway first moved to Iowa after graduation to work with the National Resources Conservation Service and thought he would stay in the state for only two years.

Twenty-five years later, he has lived all over the state, he has a wife, he has three kids, he owns Southern Goods LLC, which grows a variety of southern vegetables and produce for the Waterloo community, and he has set down deep roots in Waterloo, Iowa.

Ridgeway hadn't planned to be a farmer but found increasingly that in his work as a conservation officer he wanted to be able to teach farmers by experience.

"They seem to receive that better when you have an experience that you can share with them," Ridgeway said. "It was about the experience and being able to show farmers that you can build soil, and you can have a healthy soil and it could be productive and you don't have to have all the chemicals and all that stuff that we do now."

So, Ridgeway and his wife decided they would grow vegetables they grew up eating as part of their "soil health research project."

"We wanted vegetables that we grew up with," Ridgeway said. "We knew there was several people here from the south, and so we felt like that could be our target market."

Now, he grows as many as twenty vegetables, including okra, winter squash, and zucchinis on the 2.5 acres of land he rents in Waterloo.

"My wife says this, right?" Ridgeway said. "She says you have to bloom where you're planted. Wherever you're planted, you have to bloom there. You can't be trying to do it in Alabama and you're here. So, wherever I am, first of all, I believe that I'm called to that place for a purpose and so it is my responsibility to make sure that that purpose is carried out wherever I am."



Shaffer Ridgeway harvests baby potatoes from his farm during our visit. Ridgeway sent us home with fresh vegetables from his farm. Photo: Richard Frailing

*"Home" presentation poster by Munachim Amah.  
Images and text courtesy of Munachim Amah.*

## “We are not alone”

**G**rowing up on a farm that had been in his family since 1938, Dick Sloane watched his father rotate oats and alfalfa with row crops. His father, who also raised animals like cattle and swine, practiced biodiversity and conservation, installing grass waterways and practicing conservation tillage.

So, when Sloane got his own farm just outside Brandon, Iowa, in 1988 and started farming it, experimenting was second-nature to him. Now, he grows cover crops, practices no-till, plants prairie strips, uses as little fertilizer as possible, and tries to diversify what he grows on his farm.

“What you should do is what is going to be of long-term benefit to everyone in the community,” Sloane said. “We can’t think of everyone as being separate.”

Sloane’s philosophy comes from a rich Buddhist spiritual practice, which compels him to see the interconnectedness of all life forms, even the organisms in the soil that we can’t see. He cares about unseen organisms as much as he cares about human beings and thinks of himself as intrinsically connected to everything and everyone else.

“It’s like everything, you know, the rocks are even a part of me, because you look at them and it’s like, well, here’s fossil, and here’s air that was breathed, and there’s water that has always flown through this system, and it’s a water planet,” Sloane said.

For Sloane, home is wherever he finds himself, not a particular place or piece of land. Most importantly, it’s a feeling he gets from working on his farm and caring for other people.

“When I’m out working, it feels good,” Sloane said. “Land is a very existential kind of thing.”



Dick Sloane poses for the camera during a visit to his farm by Brandon, Iowa. Photo: Richard Prailing

## Thriving in Complexity and Chaos



A tractor rests idly on Laura Krouse’s farmland at Mount Vernon, Iowa, as the sun sets. Photo: Richard Prailing

**I**f you were just driving by Laura Krouse’s home in Abbe Hills Farm at a specific time on a late Thursday evening in June, you might wonder if someone actually lived there. There are no manicured lawns. No signs of human activity. Only prairie and tall trees growing indiscriminately around a small white house, the house itself nestled directly under a hill and tall bushes. A lone house in the middle of nowhere.

Her corn and soybean farm is up the hill, above the homestead. She grows vegetables down the hill, close to a three-acre wetland she started by the road that takes water off Krouse’s and other farmers’ lands. Krouse is proud of this practice that helps retain water in the uplands. She is proud of achieving biological diversity on her farm.

“This is a home for insects and birds and lots of things,” Krouse said. “I like that a lot.”

Yet, Krouse has struggled with moments when she feels she hasn’t done what is best for the land. She uses cover crops when and where she can on her farm but she also does a lot of tillage—and Krouse wishes she didn’t have to do this.

Tilling, Krouse says, destroys the soil, and it takes many years and a lot of soil life to bring it back to health, but farmers are faced with a difficult decision. They have to pay mortgages for their farm, and sometimes that means tilling the land to prepare it for corn and using nitrogen fertilizer so the corn can actually grow.

A strong domestic demand for corn used for animal feed and fuel ethanol has led to high prices, incentivizing farmers to increase corn acreage. Iowa leads in corn production in the United States, with many Iowa farmers shifting acres away from less-profitable crops and doing whatever they can to increase yield including tilling in the fall and using nitrogen fertilizers.

But tilling reduces soil life, which in turn depletes nutrients in the soil, and nitrogen fertilizers added to the soil wash away into streams and rivers, causing water pollution.

“People don’t want to cause pollution,” Krouse said. “But we do. We can’t risk the outcome if we don’t. If we don’t use the nitrogen fertilizer, there’s a pretty high probability that we won’t get the high yields. So, what are you doing to do?”

Krouse says it’s a systems problem: the system incentivizes farmers to grow corn.

“Nobody is negligent on purpose,” Krouse said. “Nobody is malicious. Nobody wants water pollution. Everybody wants to do their best. Everybody wants to keep the soil on their farm. Everybody wants a healthy ecosystem. But the model in which we practice agriculture doesn’t allow great ecosystem health outcomes. It’s just designed for yield. And so people including me make decisions that aren’t optimum for the environment every day of the week. I do something dumb every day of the week.”

Notwithstanding, Krouse loves her farm and what she has done with it. The shape of the land has allowed her to be creative, to try things she wouldn’t be able to try in other places. Its imperfect asymmetry allows for complexity, what Krouse calls “managed chaos.”

“Home” presentation poster by Munachim Amah.  
Images and text courtesy of Munachim Amah.

## Why do we care about a place?

**O**n Friday, June 30, my colleague Clara Reynen and I drove over hundred miles, past long stretches of corn and soybean farms, to Des Moines, Iowa, to talk to Alicia Vasto, Water Program Director at Iowa Environmental Council.

I discovered Vasto's works during my preliminary research on water quality and was curious about how she situated her life story in this work.

Vasto, who grew up in a small town in Iowa, by the Racoon River, said only after living outside Iowa for about a decade did she develop a deeper appreciation of Iowa's lands and waters.

No matter where she went, Vasto said, she always felt like an outsider and was always taken aback when people asked where she was from. "I just felt called back to Iowa."

Its culture and land are more familiar to her, but after a few years of living in North Carolina, where water is substantially cleaner and clearer, Vasto has returned to Iowa clear-eyed and ready for a change.

"I think there's a major disconnect between people and where their water comes from and their relationship to water, especially here in Iowa," Vasto said. "There's not a lot of places to go and enjoy the water, get in the water, get close to the water."

Like Vasto, many others across Iowa—farmers, community organizers, residents—care about what happens in Iowa's lands and waters.

But why do they care? Why should anyone care?



**T**hroughout my conversations with Robin Fortney, Laura Krouse, Shaffer Ridgeway, Dick Sloane, and Alicia Vasto, I wrestled with this question. But I also realized that in predicated my inquiry on care, I was seeking answers for my own life: as a black man living in Iowa, as a Nigerian living in the United States, as a thirty-something-year-old man always on the move. Where and who do I care for? Why do I care?

There's no one answer to this question. Part of the answer, I believe, lies in the beauty and inherent value of the place itself that we care for, however we define that value.

But a significant part of the answer lies within us: where we have come from, and our life journeys, which shape who we are, what we believe, and how we live our lives.



*The BlueGAP summer team explores a tributary of the Mississippi River that flows through the Swiss Valley County Conservation Park, west of Dubuque. Photo: Kate Giannini*

*“Home” presentation poster by Munachim Amah.  
Images and text courtesy of Munachim Amah.*

## Drone Essays

A second project, “Flyover Country,” by Richard Frailing, an MFA student in creative nonfiction writing, presents three “drone essays” (“[Marshall County](#)”; “[Cedar River Watershed](#)”; “[Spillway at the Coralville Dam](#)”) to offer a synoptic yet personal perspective on its featured voices and experiences. These videos offer innovative uses of drone footage in concert with lyrical essays that Richard composed as well as montages of audio from different interviews that Richard, Munachim, and a third student, Clara Reynen, conducted over the summer. The essays thus couple aerial perspectives with on-the-ground voices and help viewers approach nitrogen pollution as a social as well as an environmental problem.

Richard decided on the title after encountering the writing of Kristin Hogenson, whose book *The Heartland: An American History* (2019) interrogates the perceptions of the Midwest through history, sociology, and other lenses. Her chapter, “[Flyover Country](#),” is a thorough study of the history of aviation in the region, but she opens with a more critical thesis: “These two words convey a world of meaning. They imply that the American heartland is best regarded through an airplane window; there is really no reason to land, for the rural Midwest is a provincial wasteland in contrast to the cosmopolitan coasts.”<sup>[10]</sup> As an Iowan transplant from the coast, Richard is compelled by the tension between the coastal gaze of the Midwest that he inherited and the values that Midwesterners have of their own landscape, particularly farmers who have an outsized effect on shaping it. After studying environmental writing at Iowa State University, Richard spent a year interviewing farmers with Iowa State Extension, during which he heard numerous perspectives from farmers about the aesthetic values that inform their farming decisions.

In his drone essays, Richard drew insight from the rural sociologist Rob Burton, particularly

Burton’s 2004 article “Seeing Through the ‘Good Farmer’s’ Eyes.” Among other aspects of “productivist” farmer identity, Burton describes the role that visibility and communal expectations have in shaping the public art of farming. He particularly examines the importance of borders to communicate farming mastery between a farmer and onlookers. The tidiness of a farm, appraised by the neatness of its rows, the uniformity of its crop, and the absence of weeds—among other criteria—has clear implications for a farmer’s sense of self-worth.<sup>[11]</sup> As an artist, Richard argues that there is something implicitly “aerial” in the way Midwest farmers shape their own landscape, or at least at a removed gaze that is more concerned with geometry and yield than ecological health. His essays imply a problem of scale: the birds’ eye (or plane’s eye) view of mastery is prioritized to the detriment of both the health of the local landscape and communities downstream.

*See the videos here:*

[BlueGAP | Richard Frailing | Grad Project – Drone Essay | Marshall County | 2023](#)

[BlueGAP | Richard Frailing | Grad Project – Drone Essay | Cedar River Watershed | 2023](#)

[BlueGAP | Richard Frailing | Grad Project – Drone Essay | Spillway At The Coralville Dam | 2023](#)

Wade Dooley, a farmer who operates along the Iowa River about 15 miles from Iowa’s geographic center, posits that farmers are more akin to artists than scientists or businessmen. They are, ultimately, creative problem solvers whose creativity has been suppressed and repressed in an irrational agricultural system. So, their creativity “comes out the wrong way,” as Richard writes in his drone essay “Marshall County,” by engineering uniform landscapes over hundreds of acres of canvas. As Robin Wall Kimmerer writes about a

proverbial cornfield in *Braiding Sweetgrass*, “the truth of our relationship with the soil is written more clearly on the land than in any book. I read across that hill a story about people who value uniformity and the efficiency it yields, a story in which the land is shaped for the convenience of machines and the demands of a market.”[12]

Richard argues that devaluation of the land, which often arrives externally, can also fuse with a self-conception that accepts ecological “inconveniences” as the byproduct of an agricultural mission that is vital to the world, yet

underappreciated and “flown over.” In this devaluation, ecological “inconveniences” are accepted tacitly. The water bodies are not swimmable or fishable, but that is simply the price Iowa must pay for “feeding the world.” The deep, black soil of the Midwest is best used to grow undifferentiated, engineered grains—which are, of course, inedible—because that is what the land is *for*. Richard’s essays attempt to defamiliarize these landscapes—both natural and manmade—to loosen the sense that the land must look this way or that it always has looked this way.

## StoryMaps and Archives

Kaden St Onge, a doctoral student in English literary studies, created a StoryMap to curate the voices of rural Iowa women past and present within different watersheds throughout the state, positioning audio files, images, and narratives along axes of space and time. Drawing on research and materials from the [Iowa Women’s Archive](#), “[Watershed Stories of Rural Iowa Women](#)” profiles eight women whose oral histories are included in the archives as well as

materials from the [Women, Food and Agriculture Network \(WFAN\)](#).

Taking inspiration from WFAN, this StoryMap addresses connections between food systems, soil health, and social justice from the perspectives of gender and racial equality. In addition to rural perspectives and political issues, the StoryMap highlights women and their experiences. Despite surveys demonstrating that “women own or



Screenshot of “Watershed Stories of Rural Iowa Women” StoryMap by Kaden St Onge. See the full-size map [here](#).

co-own nearly half the farmland in the Midwest,” they are underrepresented in policy-making organizations and have historically not had access to the same education and information resources as men. Agriculture in the Midwest is a heavily white male dominated industry, and WFAN recognizes the “interconnection of ecological justice and gender equity” in building more sustainable agricultural practices.[13] In addition, when they are empowered with education and the necessary resources, women (along with people of all genders traditionally disenfranchised by patriarchal structures that dominate agriculture in the United States) are often more likely to take action toward conservation and sustainability.

Kaden’s goals for this project were to present stories and information in a less hierarchical format that considers rivers and land as focal points; to honor the history of the land and document change over time; and to connect with people’s values and encourage them to care about the immediate area where they live. Using a map as a method of data organization helps to make connections within and between watersheds and to present stories and data in a format that is accessible and easy to develop. A time slider allows a

user to perceive the position of stories at different points in time and space and so makes the map historically dynamic. This layering of perspective demonstrates change over time and presents a clearer picture of a space than a single snapshot enables. Rather than traditional political borders such as state, county, or township lines, this map instead features scalable watershed levels as the primary borders. Iowa’s ninety-nine counties overlay a near-perfect grid on the region between the Missouri and Mississippi rivers. This disconnect between watersheds and county and township borders inhibits jurisdictional cooperation around river systems. The Iowa River alone runs through nine separate counties before feeding into the Mississippi. But contemporary roads, structures, and political boundaries fade into the background in Kaden’s StoryMap so as to emphasize the connection to watersheds and the larger relative geography present in each individual’s story. By foregrounding the stories of a handful of women landowners and farmers, the StoryMap project can serve as a starting point for users to build the connections and knowledge networks that empower action.

## Story and Material

Clara Reynen, an MA student in library and information sciences and now an MFA student in the University of Iowa's Center for the Book, bound together voices from the community and the archives. She created her book, "Home is Where the Water Is," out of handmade paper, with fibers and water as the material components, and a ceramic drainage tile donated by a local farmer as its central binding. The book includes digital collage, cyanotypes, and painting imprinted in its unfolding pages. The result is a tactile and visual realization of the intersections of land, water, and stories. As with all of the pieces produced by the students, Clara's book focuses on making the

invisible visible. The drainage tile offers a medium to collapse the space between agriculture in Iowa and the consequences in the Gulf of Mexico. She embraced community involvement through the choice of text in her book, all of which is taken directly from interviews and oral histories. These quotes are woven together to speak for themselves, rather than Clara providing text based on her own understanding of the issues. Letting those most directly involved and affected speak for themselves allows her to amplify their voices, rather than use them for a predetermined end goal.



*Clara Reynen "Home is Where the Water Is," 2023. A closeup image of the second of four panels, this image shows pigs from a concentrated animal feeding operation (CAFOs) contained within a water droplet, symbolizing the large-scale damage CAFOs have on our water quality. Image courtesy of Clara Reynen.*



*Clara Reynen “Home is Where the Water Is,” 2023. The final display of the artist’s book, which is housed inside a ceramic drainage tile and stretches to be approximately 8 feet long while displayed, alongside other handmade paper samples from the summer collaged together to be reminiscent of aerial photography of farms and various crops found commonly in Iowa. Image courtesy of IIHR—Hydroscience and Engineering.*



## Voices, Choreography, and Montage

Ellen Oliver, an MFA student in dance and choreography, blended these same voices from the interviews and archives with choreography and motion-capture video to produce a video montage of movement and sound, “[Watershed Stories](#).” This short video, developed through Adobe After Effects, is intended to bring people closer to their watersheds by expressing the physicality of water. Ellen layered video footage of dance, underwater shots from local waterways, drainage tiles, plants from a local farm, and samplings of the drone footage from Richard’s “Flyover Country.” She spent early weeks in the dance studio to generate movement phrases based on the information that the team was gathering from concurrent field trips and presentations. She was interested in the movement of water, and she designed movement scores based on the qualities of the water in Dubuque and Iowa City. The movement was shaped by the topography of the Mississippi; her arms, legs, and torso moved in response to the directionality and angles of the Mississippi and its tributaries.

Each week, Ellen collected footage for the video. She experimented with filming underwater at multiple locations, including the Iowa City public pool, the Iowa River, the Cedar River, and a pond next to the university’s Art Building West. The footage in the natural water was much murkier compared to the pool water, which added contrasting effects in the editing process. She also noticed her own physical reaction to filming in Iowa’s water. The water often emitted pungent odors and she found many dead fish scattered along the river’s edge. Her body became

tense with caution while filming in these spaces. Filming between natural and artificially maintained spaces allowed her to reflect on how people express their comfort in the water. Additionally, she filmed Clara and her paper-making process, which provided footage of water moving through the paper press channels. She filmed the choreography and the drainage tiles on a green screen. Later, she inverted the image, keyed out the green, and filled the moving image with shots of water. The editing process was very time consuming because she was compiling dozens of layers within each frame, but it allowed her to blend multiple shots so as to highlight the relationship between fluid movements and drainage tiles. The result is a video that incorporates the voices and stories of Iowa farmers, past and present, and gives them artistic form.

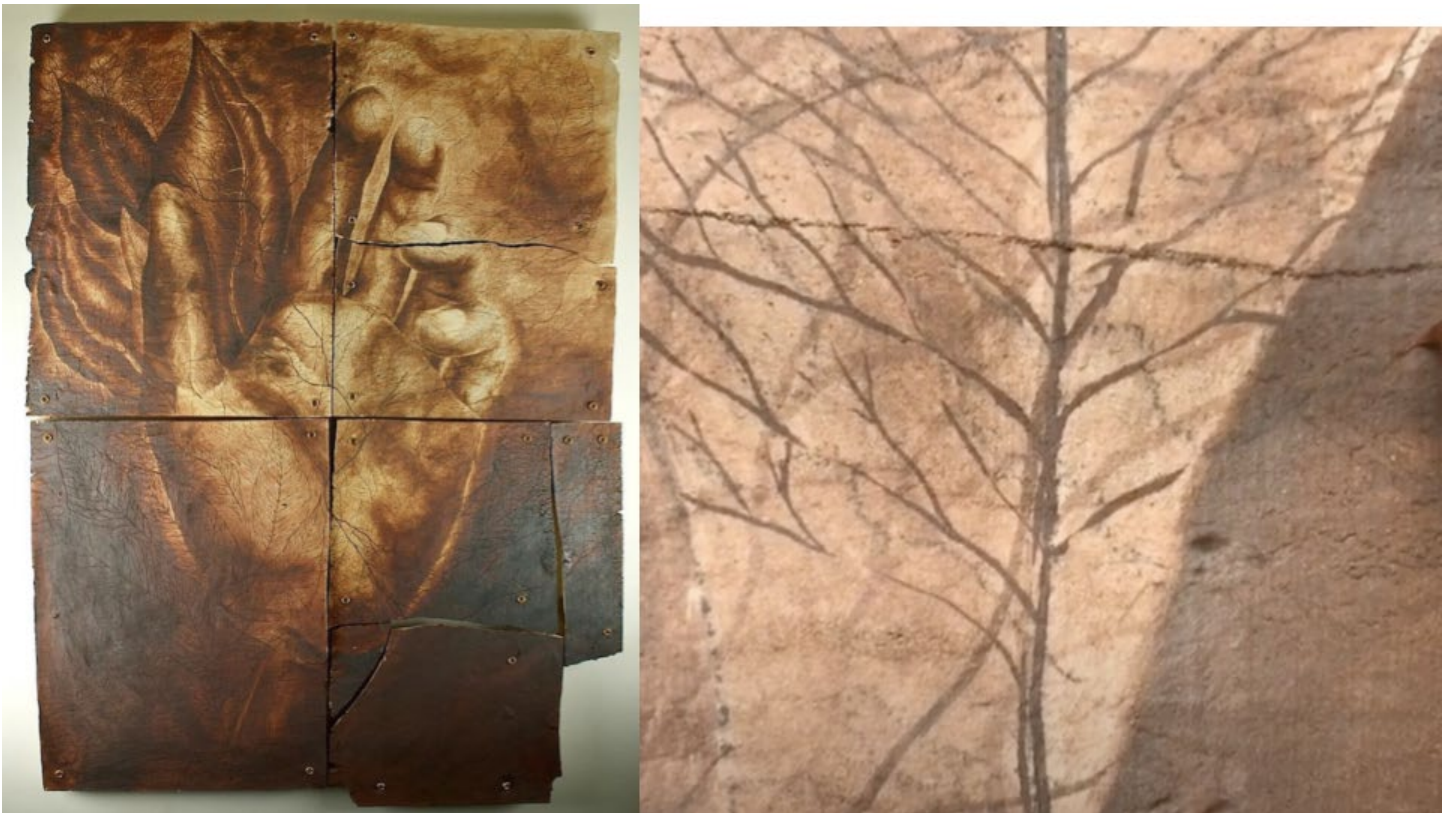
Her goal is to project the video at different locations along Iowa rivers, mapping the projection onto a solid object near the water so that it aligns with the design of the space. Ideally, the video would play on a loop for the public to stumble upon. This offers one method of sharing the work of BlueGAP with a wider audience and draws more attention to local water quality. At the same time, Ellen’s video, alongside all of the other projects, is being incorporated into the BlueGAP Information Platform, placing experimental art and media alongside people, places, and community champions as inspirations for action.

*See video here: [BlueGAP | Ellen Oliver | Grad Project - Dance | Watershed Stories | 2023](#)*

## Mural and Repurposed Materials

Javier Espinosa, an MFA student in ceramics, created a beautiful large-scale mural and accompanying repurposed drainage tiles glazed with organic designs. His piece, “The Hands and the Rivers,” takes up the ideas of Land Art theorists, specifically how art forms a language that emanates from our aesthetic needs. Artists may thereby facilitate understandings of our experiences through expressions of our relation to the environment and to others.<sup>[14]</sup> His work draws on this aesthetic need to convey a clear message to viewers and evoke viewers’ deep relationship

with lands and waters. In their multiple forms of expression, the arts can also produce a reencounter with visual nature and its emotional character. In realizing his project for BlueGAP, Javier focused on patterns that could represent a kind of emotional reunion with water, rivers, nature, and the craft of farming. As he listened to the experiences of different community partners who shared their stories and perspectives, he realized that all the stories could come together like a hydrological map in which the common thread would be the emotional relationship Iowans



*Javier Espinosa “The Hands and the Rivers,” 2023. This ceramic mural evokes a deep connection between human labor and nature’s flow, highlighting the interplay of cultural and environmental elements. Image courtesy of Javier Espinosa.*

have with the lands and waters of their state. The ceramic mural he made represents this reflection. He used Peter S. Stevens's concepts of patterns in nature to evoke the idea of the ramification design pattern that can be found in leaves, aquifers, and the textures of hands.[15]

Javier's mural expresses a vision of farmers as practitioners of a craft. From his own perspective as an artisan, his approach was to invoke a sense of the craft in which the material is respected or

even loved and cared for. He glazed botanical images on drainage tiles that were obtained from various farmers. These pieces are a proposal that exalts the concept of the craft and the pride that prevails in those who make things with their hands. His mural attempts to establish a story that unites rivers, land, and humans as a single character. If we lose the water, we lose the land and we lose ourselves.



*Javier Espinosa 'Endemic Culture,' 2023. Made with ceramic drainage tiles from the Iowa area, it reflects on the interwoven identities of tradition and landscape, exploring the transformation of cultural heritage. Image courtesy of Eric Gidal.*

## Moving Forward

These varied works sit side-by-side on the Blue GAP online platform with water quality data, interviews with water quality champions, and short features on nitrogen pollution and community organizing. The aim is to present a range of approaches to storytelling around this crucial topic. But these works also provide a basis for community outreach. In the fall of 2023, the team showcased their work at a public gallery in Iowa City: *Fluid Impressions: A Water Quality Exhibit*. They invited members of the community to view the pieces alongside a prototype of the BlueGAP platform to facilitate reflection on the many social, historical, and aesthetic dimensions of the problem. In collected surveys, visitors to the exhibit commented on the variety of interdisciplinary approaches, the creativity of the contributing artists and scholars, the use of multiple media to describe people's relationships with water, and the integration of farmers' voices. People noted how both the beauty and the diversity of the pieces effectively communicates scientific topics to a general audience and demonstrates the multiple ways in which human activity affects water quality. And they took inspiration from the different approaches to consider ways in which they too might fit into the picture and how their own words and deeds can make a difference.

Indeed, what these projects seek to provide is an *aesthetic* connection to the problems of nitrogen pollution. Aesthetics, from the Greek term for *perception*, is the name we give to the mediation between sense and reason. Neither a purely sensory experience nor a purely rational understanding suffice to comprehend any situation or condition. But when we give those situations or conditions aesthetic form, we help connect information to values and make visible and tangible that which is often unseen and abstract. BlueGAP seeks to make visible that which is invisible—nitrogen, most prominently, but also the larger systems of economics, law, and

society that amplify its presence in our waters to degrees that are unhealthy and unsustainable. A large part of that effort involves the use of “hydroinformatics” to provide resources for advocacy and change. But a key insight of the BlueGAP project is that any meaningful response to these problems requires storytelling as much as data, poetics as much as politics, aesthetics as much as engineering. While the problems in any one location—be it in Iowa, Florida, or the U.S. Virgin Islands—must be understood as symptomatic of larger systems, meaningful responses will need to speak as much to the local as to the global if they are going to have any positive impact on people's lives and the lands, airs, and waters they inhabit.

In April of 2024, Eric Gidal was able to travel to Sidney, Iowa in the southwest corner of the state to share this work with a group of local citizens who had gathered to learn about [a particularly devastating nitrogen spill in the East Nishnabotna River](#) in March 2024. Alongside David Cwiertny and Adam Janke, a wildlife extension specialist at Iowa State University, Gidal presented the materials produced by the students and a narrative of their production to address the role of storytelling in confronting environmental disasters.

Soon after, Gidal assembled a new team of students for a second iteration of this summer program. They came from programs in creative nonfiction writing, English literary studies, French, geography, graphic design, and history. They built on the work of the first team while exploring other media and modes for creative storytelling and engaged action. Their work resulted in a second StoryMap that draws connections between nitrogen pollution and frontline communities, a tone poem that represents the environmental history of Iowa through ambient sound and recorded interviews, a set of lyric profiles and accompanying photographs, a sequence of creative data visualizations, a

documented engagement with members of eastern Iowa's Francophone immigrant community, and a virtual exhibit on the drawings and writings of J.N. "Ding" Darling, an editorial cartoonist with the *Des Moines Register* and active conservationist of the 1930s and '40s. The projects will join the work of the first team, both online and in exhibitions around the state.

This collaboration between faculty and graduate students in the arts and humanities with faculty and staff in engineering and hydrosciences achieves many ends. It provides the students with valuable research skills, experience in collaborative, cross-disciplinary production, and expertise in publicly engaged scholarship and art. It contributes useful materials for a larger platform seeking to promote environmental

change and social justice. And it offers a model for other initiatives in publicly engaged environmental arts and humanities. Doris Sommer calls us to dedicate ourselves to "an optimism of the will, beyond the despair of reason, [that] drives life toward social commitments and creative contributions."<sup>[16]</sup> The projects described in this article will not solve the problem of nitrogen pollution on their own, but neither are they merely supplemental to the data and action plans featured on the BlueGAP platform. Rather, they address nitrogen pollution in new terms and new forms. They speak across different communities and across different watersheds. They generate new understandings of factors polluting our waterways and they help us to imagine new possibilities for the future.

## Footnotes

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## About the Authors

Eric Gidal is professor of English at the University of Iowa. His recent scholarship includes *Ossianic Unconformities: Bardic Poetry in the Industrial Age* (University of Virginia Press, 2015), articles on Scottish and French Romanticism, and co-authored studies of Scottish literary and environmental history that apply methods of computational linguistics and geographical information science. He has served on the advisory board of Humanities for the Public Good, a Mellon Foundation–funded initiative at the University of Iowa and is senior personnel for the Blue-Green Action Platform, an NSF-funded multi-institutional and cross-disciplinary initiative to empower communities to address nitrogen pollution along and across watersheds.

Munachim Amah is a writer and academic from Nigeria. His creative work has appeared in *The Georgia Review*, *Munyori Literary Journal*, *Saraba Magazine*, *Kalahari Review*, and *African Writer*, and his journalistic writing has been published on African Arguments and CNN. He is a doctoral candidate at the University of Iowa School of Journalism and Mass Communication.

Javier Espinosa is a Mexican artist based in the United States. His ceramic-sculptural work reflects his cultural heritage and background in traditional Talavera pottery. As an immigrant, he seeks to celebrate and preserve the traditions of his homeland while bridging cultural gaps. His art merges traditional techniques with contemporary expression, creating pieces that resonate with his heritage and experiences in a new environment.

Richard Frailing is an MFA candidate in the nonfiction writing program at the University of Iowa. Originally from the salt marshes of southeast Virginia, he has worked as an ecologist in the Midwest and on the east coast, and he holds an MFA in poetry from Iowa State University. His work has been awarded an Academy of American Poets Prize and the Roxanne Mueller Essay Award.

Ellen Oliver (she/they) is a dance and digital media artist currently based in Blackstone, MA. She received her MFA from the University of Iowa Department of Dance, where she also spent a summer as a graduate research assistant for the Blue-Green Action Platform in 2023. Ellen Oliver's artistic work explores the relationship between rock climbing and choreography.

Clara Reynen is a graduate student at the University of Iowa pursuing a dual Masters of Library and Information Science and Masters of Fine Arts in Book Arts. She is primarily a paper-based artist and is interested in what stories a substrate often taken for granted—paper—can tell on its own and in conjunction with other materials.

Kaden St Onge is a PhD candidate in English literary studies at the University of Iowa. They work primarily on twentieth- and twenty-first-century American literature, with research foci in decolonial theory, geography, multilingualism, settler colonialism, and bioregionalism. Their dissertation project explores constructions of identity within a Midwestern literary landscape.