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PROSPECT

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The cover image of the estuary of the Klamath River and ceremonial site of the Yurok Indian Tribe is by Linda Tanner via Flickr. CC BY 2.0.

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CONTENTS

INTRODUCTION

INTRODUCTION TO ISSUE 27 | PROSPECT

By Laurie Moberg, Editor

"Take a step back; it'll help you gain perspective and evaluate what is most important." Many of us have probably heard this advice often.

Sometimes this advice can refer to a literal step. This fall, I spent time hiking at Frontenac State Park on the Minnesota side of Lake Pepin on the Mississippi River. As I was hiking along the bluff, I found myself watching my feet and the narrow path ahead of me. When I managed to take a step back, away from the bluff's edge, I was able to lift my head and to see the whole landscape: the beauty of the autumn colors, rock outcroppings, and expansive lake before me. It was startling to realize I'd been missing this expansive view in my (nonetheless valid) concerns over the daunting path in front of me.

Sometimes this advice to step back is intended more figuratively, a suggestion to pause for introspection or to consider a situation anew. By taking a step away from a challenging situation, we might be able to gain a new perspective. I find this a valuable action when confronting current uncertainties that might otherwise overwhelm me: climate change, elections, genocide. Rather

Bluffs on the Mississippi River at Lake Pepin from Frontenac State Park, Minnesota. Image courtesy of Laurie Moberg.

than repeatedly immersing myself in the data and stories of struggles that might lead to a sense of helplessness and despair, taking a step back helps me consider the layers of these challenges and craft a fresh vision for engagement. With this practice, I see the prospects for the future differently.

The articles in this issue of *Open Rivers,* called "Prospect," speak to the multiple meanings of this word. A prospect involves taking in an extensive view as a way of seeing opportunities and, possibly, problems. A prospect also refers to looking forward with a vision of the possibilities for the future. For the articles in this issue, these two meanings of prospect intermingle; authors demonstrate how different practices—especially art—can reveal different ways of seeing the environmental conditions of our present and opportunities for envisioning the future otherwise.

Some of the content in this issue aims to disrupt dominant paradigms, offering an invitation to take in a more expansive prospect. Sigma Colón and Juli Clarkson explore how a variety of humanistic and artistic practices—including the creation of artists' books—can compel us to see our relationships with water systems differently. They argue that visual art and humanities can compel us toward seeing rivers as creative and co-creators. Saloni Shokeen challenges a dominant understanding of a particular river: the Ganga. Its cultural significance, Shokeen argues, masks its material degradation even in the wake of widespread pollution that peaked during the second wave of COVID-19.

Other articles in this issue make obscured prospects visible through creative works. Jonee Kulman Brigham demonstrates how she uses art and community engagement to make hidden water infrastructures legible to youth through an experience of an Earth Systems Journey at Big Stone Lake. In "Fluid Impressions: Connecting Data and Storytelling in Iowa's Watersheds," a team of faculty and student authors create artistic content—from drone essays to murals to StoryMaps–to facilitate aesthetic connections to the data of nitrate contamination. Their artistic works not only make nitrate pollution perceivable in a different, engaging way, but also implicate larger systems and institutions. The opportunities for artistic expression described in both these articles offer new forms for considering the material conditions of our waters and new prospects for addressing its material challenges.

Enticing us to see particular landscapes through their eyes, two authors offer us new prospects on long storied rivers. Vivek Ji gives us an encompassing view of the Narmada River in India, detailing both the changing landscape of the river and its sacred history as he explores it on his 3,000 km pilgrimage. Through essay, poem, and image, Laura Rockhold shows how language and places reciprocally shape each other. For her, visiting the confluence of the Minnesota and Mississippi Rivers became a different experience when she embraced its Dakota history and name: Bdóte.

While many of the articles implicitly speak to transformation and visions of the future, two articles address the idea of future prospects more explicitly. Kachina Yeager, Sage Yeager, and Shelley Buck discuss the ways that Owámniyomni (also known as St. Anthony Falls) is being redesigned and reinvigorated as a Dakota space. Drawing on Dakota values and processes, Owámniyomni Okhodayapi, an Indigenous-led nonprofit, has a vision for transforming this place into a site that honors its Dakota history and future. In her review of A*ll We Can Save: Truth, Courage, and Solutions for the Climate Crisis*, Marceleen Mosher explains that this collection of works on climate change aims to leave readers not with a sense of despair, but with an empowering sense of agency to take action; in short, with hope.

Reading these articles, I returned to the idea that these authors are offering us the prospect of seeing the conditions of our environment a little differently, widening our scope, and animating potentials for the future. They offer us the power

of art, of language, of being present in a place, and of hope. While none of these works alone can capture the complexities of our water systems and the ways they are inextricably part of our social systems, they each activate inspiring methods and forms of engagement with the environment that might expand our view of what is possible and necessary. These articles, then, invite us to consider how the prospect of art, creativity, and connection can transform how we understand environmental conditions and how we create the future.

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About the Author

Laurie Moberg is the editor for *Open Rivers: Rethinking Water, Place & Community*, a digital journal of public scholarship published at the University of Minnesota (UMN) by the Institute for Advanced Study and UMN Libraries Publishing. She earned her Ph.D. in anthropology from UMN in 2018. Her doctoral research investigates recurrent episodes of flooding on rivers in Thailand and queries how the ecological, social, and cosmological entanglements between people and the material world are reimagined and reconfigured in the aftermath of disasters. In her current work, she approaches public scholarship as a critical strategy for expanding whose stories are heard, for shaping our public conversations, and for forming solutions for our shared ecological challenges.

FEATURE (PEER REVIEW)

RIVERS AS CREATIVE ECOLOGIES

By Sigma Colón and Juli Clarkson

Editor's note: This feature article has been peer reviewed.

As an "extractive zone," the Klamath River has long been a space where capitalist extraction has been challenged and resisted. Considering the intertwined structures of colonialism and capitalism, Macarena Gómez-Barris describes the extractive zone as a material and conceptual process that "names the violence that capitalism does to reduce, constrain, and convert life into commodities, as well as the epistemological violence of training our academic vision to reduce life to systems."[1] Rather than succumb to the totalizing logics of colonization and commodification, Gómez-Barris offers alternative acts of perception that broaden our

The estuary of the Klamath River, formed by the mile long sand spit that crosses the mouth of the river. The buildings are part of a ceremonial site of the Yurok Indian Tribe. Image by Linda Tanner via Flickr. CC BY 2.0.

understanding of natural and social ecologies. Efforts to honor the Klamath River as a lifeway and to protect aquatic habitats on tribal lands have culminated in what is currently one of the largest dam removal projects in history. This watershed moment for Indigenous Nations and salmon of the U.S. Pacific Northwest will give new life to the once abundant Chinook runs that were decimated by the Klamath Hydroelectric Project. Inspired by ongoing dam removals, by Gómez-Barris, and by the collection of works in *The Routledge Companion to Contemporary Art, Visual Culture, and Climate Change*, we worked together to consider how humanist work and visual art together can move us away from thinking of rivers as mainly freshwater systems to instead recognize rivers as creative ecologies that animate visual and conceptual representations co-produced among artists, scholars, and rivers. [2]

In what follows, we explore how activists, artists, scholars, and rivers might co-create riverine engagements that interrupt the extractive capitalist, heteropatriarchal, and watershed-colonialist projects that have degraded rivers and continue to exacerbate the current ecological crisis. Embracing our commitments to humanist work and visual art we worked together to consider the creative, agential, and living force of rivers that: challenges the permanence and progressive conceptions of dams and hydroelectricity; is integral to Indigenous Traditional Knowledge and movement building; empowers feminist activism; and offers distinct aesthetic ways of deep looking and understanding. At the heart of our exploratory project to conceptualize rivers as creative ecologies is our collaborative effort to let our considerations animate and inspire our own writing and art.

Watershed Colonialism on the Klamath River

Historically one of the most abundant salmon habitats on the West Coast and deeply significant to the Klamath Tribes of the upper and lower basins, the Klamath River's transformation began in 1905 and culminated in the Klamath Hydroelectric Project that includes four hydroelectric dams and a fifth dam used to regulate water levels.[3] As one of the U.S. Bureau of Reclamation's earliest projects, it embodies ideologies of "watershed colonialism," meaning the ongoing processes that facilitate settler occupation by using rivers as sites of extraction and as resources for exercising power over regions. [4] Shifting settler colonialism's emphasis as a "land-centered project" structured to dispossess Indigenous people of their ancestral lands and make way for capitalist resource extraction, the concept of watershed colonialism focuses on rivers as sites of occupation, but also of struggle and resistance.[5] In the Klamath basin, watershed colonialism manifested as colonial hydrology and engineering projects that devastated Klamath River ecologies. These projects used the river to irrigate arid land in the U.S. West and sustain settlers through federally subsidized agriculture and ranching. Klamath Tribal communities continually resisted the federal government privileging dams and irrigation for settlers, and, more recently, they reclaimed the river.[6] With their sights on dam removal, in 2019 the Yurok Tribe of the lower basin passed a resolution granting "rights of personhood" for the Klamath River.[7] Rights of Nature legislation that provides ecosystems with legal personhood status has a long history that in recent years includes the Whanganui Iwi of New Zealand granting the Whanganui River legal personhood and the Ganges and Yamuna Rivers in India becoming "legal and living entities" with personhood rights. [8]

The ongoing recovery of the Klamath River watershed and successful challenges to colonial hydrology could be considered steps towards

addressing centuries of watershed colonialism and its attendant extraction. Kelsey Leonard et al. advocate for broader implementation of Indigenous-led policy, research, and caretaking including a Water Back framework for advancing "the return of Water and kin to Indigenous governance in a way that empowers the resurgent Indigenous Water relationships that are integral to Indigenous cultural, biological, spiritual and political sovereignty; this includes cosmogony, ceremony, access, law and policies."[9] They challenge conceptions of water as a "colonial asset" meaning "the view of Water as a resource that is extracted and valued only for its usefulness to humans, a perspective that diverges from most Indigenous cosmologies."[10]

Cinematic River Ecologies

Challenging processes of watershed colonialism—materially, by removing the concrete and steel of dam infrastructure, and conceptually, by conveying the fluidity, impermanence, and potential transformation of rivers and people outside of colonialist infrastructure and extractive relations—inspires co-constitutive acts of creation. Among visual art traditions, film has been integral to contesting ongoing impacts and practices of watershed colonialism, but also to conveying the aesthetic and contemplative aspects of rivers that emphasize fluidity as an integral part of conceptualizing river reparations.[11] Across the global north-south divide, river documentaries creatively capture Indigenous-led deadly struggles against capitalist development that threatens life-sustaining freshwater flows. For example, Katia Lara's documentary *Berta Vive* (2016) about Berta Cáceres who campaigned against the Agua Zarca dam on the Río Gualcarque in Honduras, and Michelle Latimer's series *Sacred Water: Standing Rock Part I* and *Red Power: Standing Rock Part II* (2017) about the Standing Rock movement against the construction of the Dakota Access Pipeline in the U.S., capture historical violence and current militarized state violence against peaceful water protectors who risk their lives to fight against Indigenous water dispossession and to keep rivers flowing and free from oil contamination.[12] Leonard et al. emphasize that "Indigenous communities have advocated on behalf of Water for generations" and they describe rematriation—"the process of returning Water, Land, culture, and spirituality to Indigenous women to address the ongoing impacts of colonialism, patriarchy, and gender-based violence"—as integral to Water Back.[13] In her analysis of Traditional Indigenous Knowledge and water protection, Deborah McGregor also examines the importance of women's care, maintenance, restoration, and advocacy for waterways.[14] Themes connecting gender with water advocacy come up in Lara and Latimer's documentaries; these artistic cinematic portrayals contribute to, and are themselves outcomes of, movement building and the community connections that grow from Indigenous people's commitments to river ecologies.

The vestiges of colonialism are made visible through art, even as absences. In filmmaker Thomas Riedelsheimer's documentary of artist Andy Goldsworthy, *Rivers and Tides: Andy Goldsworthy Working with Time*, ecological installations come to signify cycles of time, settlement, and human impact. While in his native Scotland, Goldsworthy notes that "there's an absence in the landscape because of the effects of sheep; they've written on the landscape."[15] Theorizing with sheep and responding to Goldsworthy's observation about the lack of trees and emptiness left behind by sheep, Julian Yates notes that "their presence remains as an aching absence, a writing deployed by English colonizers in order to unwrite particular human persons and a place."[16] Goldsworthy uses art to

address the erasure by covering stone with wooly threads that conjure the presence of sheep.

See the video "Andy Goldsworthy Natural Sculptures With Ice, Stone & more | Rivers and Tides" from Documentary Central.

In the final scenes of *Rivers and Tides*, Goldsworthy again uses stone to symbolize transformation and temporality. In this scene—that beautifully captures the ephemeral quality of his art—Goldsworthy meticulously grinds small, red, iron-rich stones found strewn about the riverbed. Leading up to this moment we see him casting about searching for these otherwise imperceptible rocks. Having found the red in the river, he makes it visible in such fleeting and dramatic gestures that what remains is the visceral reaction that comes with seeing what looks like blood gushing down the river. Goldsworthy uses the bright red powder to create concentrated pools of blood-red water inside rock crevices, streaks of it dripping from stones; the color, he says, "seems so alien, but it's a part of the river, at its very core." Throughout the film, Goldsworthy uses the river as a visual and conceptual metaphor and here, at its apogee, it becomes a river of life: first, by the ostensible lifeblood shared by humans and nature; second, by the simulacrum of the earth bleeding; and third, by the natural cycle of the rock. He describes the powdered rock as an instant in a cycle that moves from solid to liquid forms of stone. At the time of this insight, he is central to that natural cycle—violently speeding up a process that in geological time would take countless years.

During one of his ruminations, Goldsworthy articulates his catharsis related to a representational element that is central to much of his art: "We set so much by our idea of the stability of stone and when you find that stone itself is actually fluid and liquid, that really undermines my sense of what is here to stay and what isn't."[17] Goldsworthy captures a process of coming to terms with the fluidity and impermanence of human and natural worlds and through his art we envision rivers as creative ecologies that influence physical and social relations. *Rivers and Tides* becomes a study in process and creative experience more than a portrait of an artist with his finished works; as Victoria J. Gallagher, Kelly Norris Martin, and Magdy Ma argue, Goldsworthy's art leads audiences "toward a deeper kind of looking."[18] This actively engaged method of looking is emblematic of the role that rivers as creative ecologies play in deepening our attention and thinking to address and potentially transform unjust processes that impact ecologies and social existence.

Material Art and River-Based Resistance

While film mediates remote connections to river geographies, textiles symbolize more intimate engagements with waterways that can politicize the affective impacts of dams on everyday life. In Brazil, women in the Movimento dos Atingidos por Barragens (in English, the Movement of People Affected by Dams) use *arpilleras*—a popular textile art from Chile used in the 1970s to denounce the military violence of Pinochet's dictatorship—to resist hydropower dams and condemn the violent extractivism and displacement caused by dam infrastructure.[19] Focusing on how women have used arpillera embroidery as a political tool to organize and resist the Baixo Iguaçu dam in South Brazil, Tamara Rusansky emphasizes how this artform had three meaningful effects: it made visible the human suffering inflicted on displaced communities, illustrated the socioecological impacts of damming rivers, and also challenged women's exclusion from leadership and decision-making processes despite them being most affected by the dam building that destroyed community life.[20]

Using a feminist approach to political ecology, Rusansky argues that the collective process of creating arpilleras produced a political space for women to participate in the struggle against dams. In this struggle, women were traditionally relegated to providing reproductive labor—maintaining the household, providing affective support, doing unpaid care work and taking on additional burdens to maintain family agriculture while men participated in meetings and public hearings and engaged in direct action. Creating textile art to express their struggles and resistance expanded women's political participation.[21] The transformative impacts of women's arpilleras were part of the Iguaçu River's creative ecology—resisting the dams that marked the river as an extractive zone doubled as a challenge to the constraints that had intended to limit women's political participation to their reproductive labor.

See a video interview with Verónica Sánchez which shows many examples of arpilleras via Museo Violeta Parra.

Like the socially engaged practice of arpilleras, artists' books can be forms of public art that foster embodied and creative ways of engaging rivers as lifeways that both endure and resist colonialist legacies.[22] Jo Milne argues that the tactile qualities of artists' books that call viewers to engage by touching, and the temporal element that adapts to and changes with every new viewer, allows them to "transmit and generate the exchange of ideas on multiple levels."[23] Artists' books made of materials such as paper, fabric, and leather create unique sensory experiences and provide moments of discovery for viewers who enter layered and interlinked "systems of representation."[24]

The fluidity and malleability of artists' books make them useful vehicles for disseminating and transmitting alternative perspectives because viewer interactions with a book's content changes with each new person handling the artwork. It is these unexpected and dynamic interactions that mark the function of an artist book as what Milne argues, a "mutable mobile."[25] The mobility of artists' books comes down to the ease with which they can be shared beyond museum spaces where interacting with artifacts becomes limited if they are displayed behind glass or otherwise not available to touch. Instead, groups of artists have found alternative methods of dispersing their work, including art fairs, gallery openings featuring artists' books, and library collections. According to Milne, all these methods call for the activation of the artists' books through the viewer's touch. It is though the viewer's ability to touch and engage with artists' books in a variety of ways that the work mutates with each interaction.

Artist Books Coproduced with Riverine Perspectives

Artists' books became the medium we chose to reimagine how humanist research and visual art together might inform new ways of thinking about rivers as creative ecologies and sites of public engagement. Through a Lawrence University summer fellowship that funds students working with faculty on research projects, we brought our academic and artistic training to bear on the question of how to make riverine ways of thinking take shape through visual art. After reading Sigma's ongoing research on the concept of "watershed colonialism," Juli created two artist's books that incorporated tactile interactions to capture the degradation and extraction endured by watersheds, but also to think with rivers as creative ecologies that can renew and can be restored. The goal was to subvert the viewer's touch by transforming their manipulation of the artist's books into actions that foreground the agency of the freshwater depicted in the books,

which are titled *Cycles (un)Changed* and *Release*. Contributing to art inspired by the creative ecologies of rivers, these books highlight the fluid, impermanent, and changing elements of rivers.

Cycles (un)Changed

The first artist's book, *Cycles (un)Changed*, utilizes a movable book structure allowing viewers to fold, turn, and open to each page in a never-ending cycle. The sense of ambiguity around the book's beginning and end allows for a new and ever-changing flow of information when a new viewer touches, turns, and explores the contents of the book. The book begins with a close-up illustration of rippling water (see figure 1), then cycles the viewer through collaged stages of water degradation caused by the encroachment of pop-up forms that reference human settlement

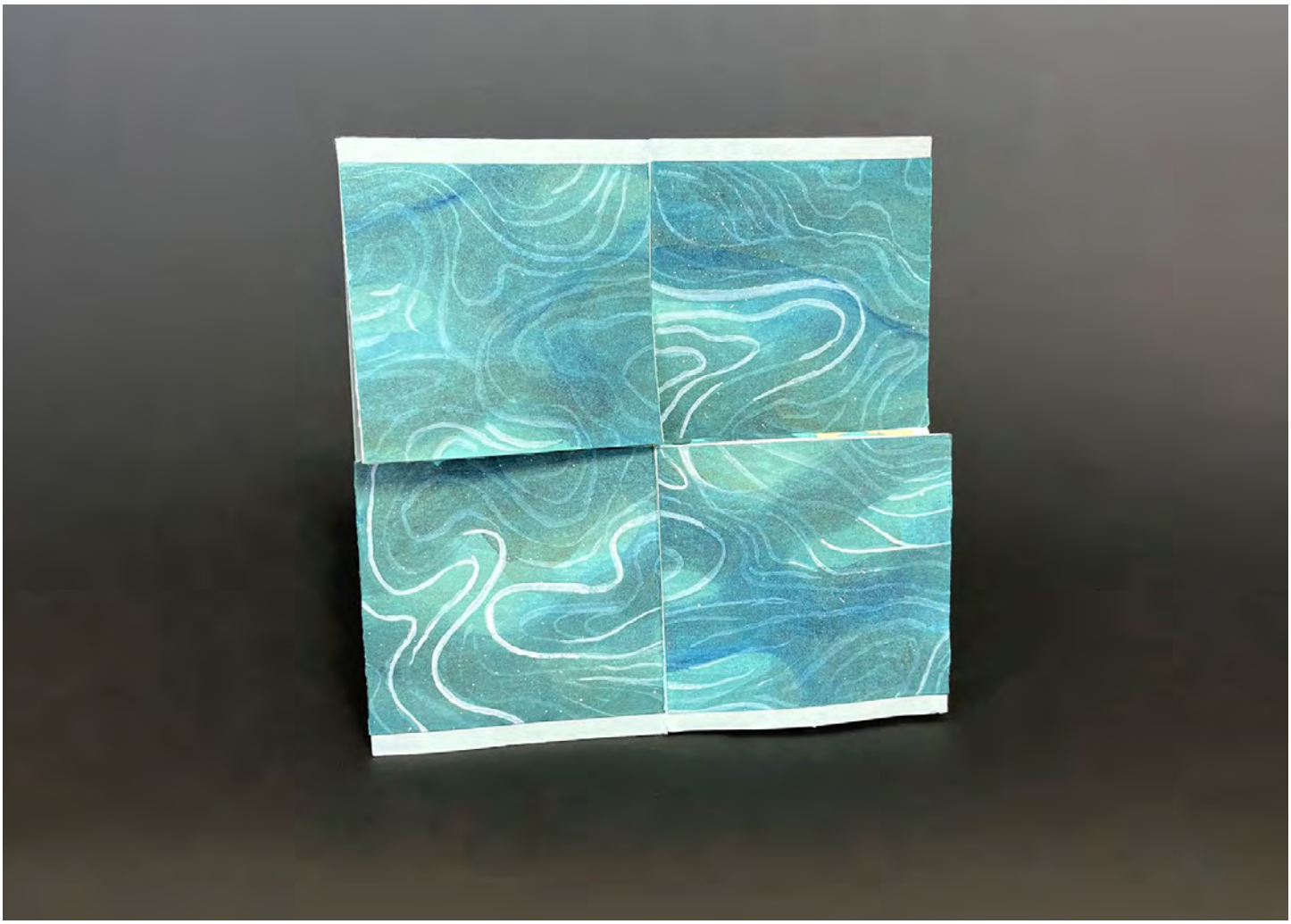

Figure 1. Front of artist book "Cycles (un)Changed" by Juli Clarkson, 6.5" x 6.5", 2023. Image courtesy of Juli Clarkson.

(see figures 2 through 4). Experiencing the artist's book in this context challenges viewers to reflect on long histories of colonialist practices that damaged watersheds through their focus on human occupation and prioritization of capitalist extraction at the expense of local rivers and bodies of water.

Viewers can change the starting point for viewing the book or flip through it in reverse thereby creating a new lens through which to interpret and understand the work. *Cycles (un)Changed* exploits the book's mutating meaning to uncover the effects of watershed colonialism as nonlinear and ever-evolving processes. The book cannot be viewed within an already established and isolated linear manner. Instead, the artist's book requires multiple interactions, activations, and explorations to reveal the submerged patterns of watershed colonialism that have culminated into the present effects of watershed degradation and decline.

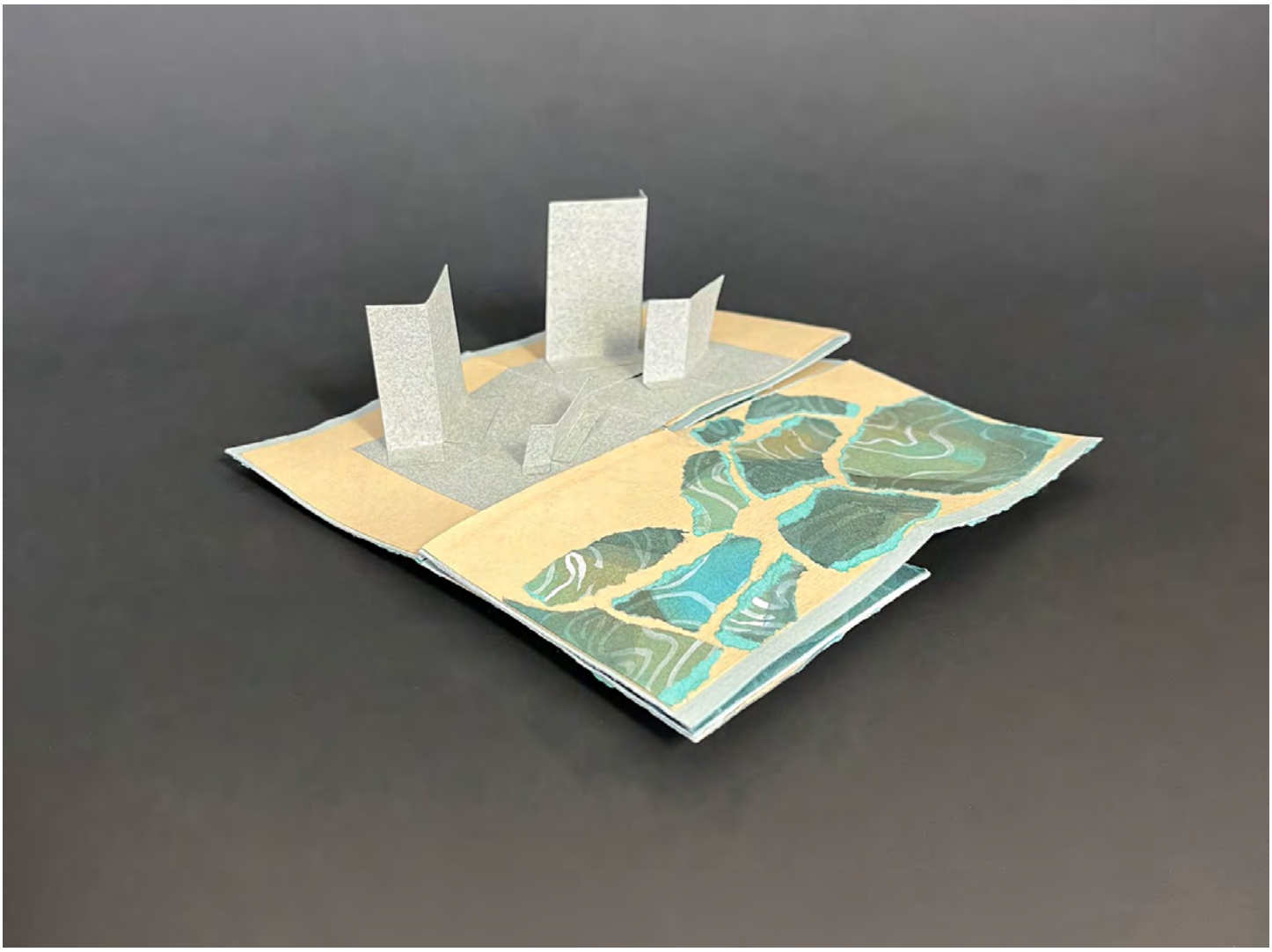

Figure 2. Cycle of human occupation in "Cycles (un)Changed." Image courtesy of Juli Clarkson.

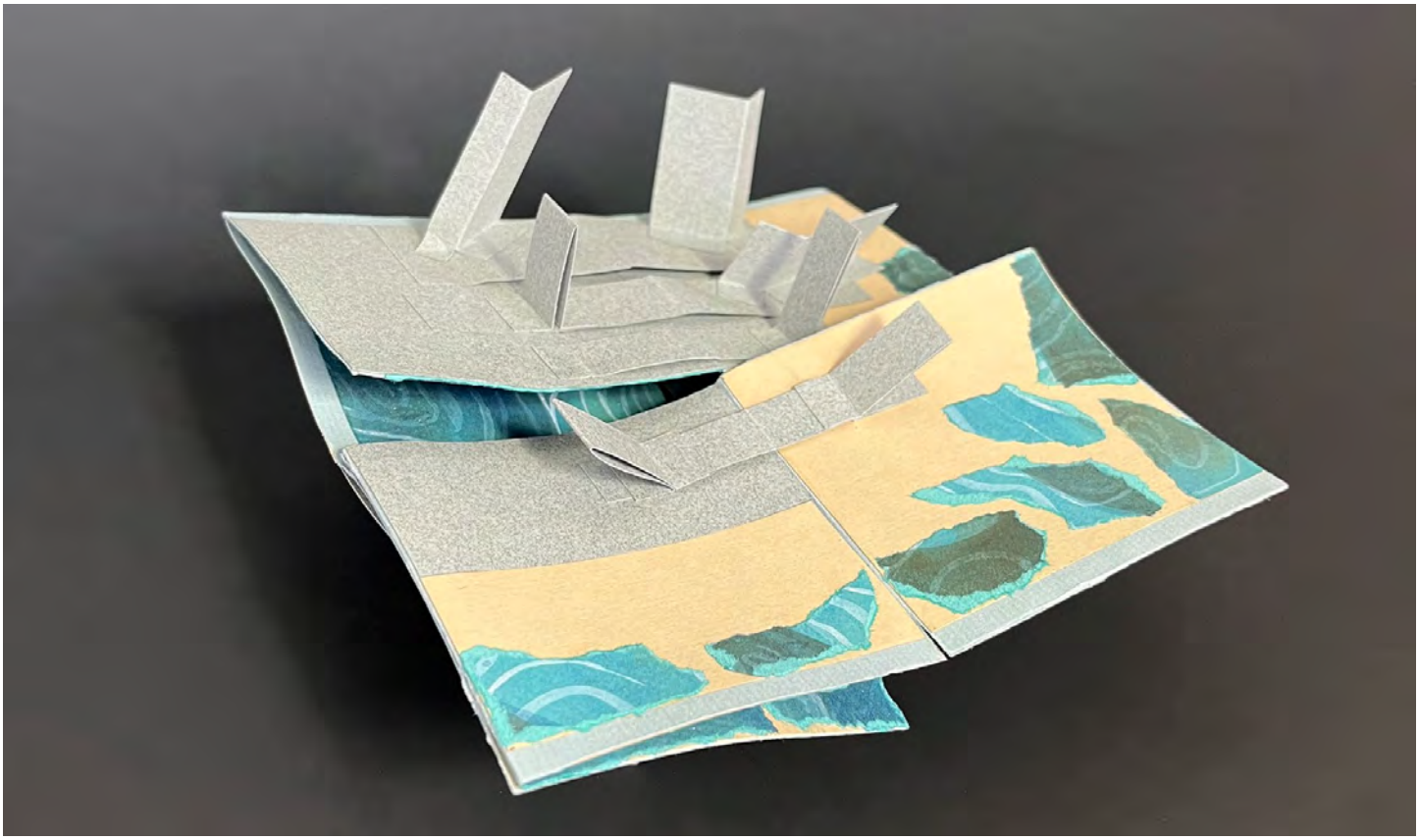

Figure 3. Cycle of human occupation in "Cycles (un)Changed." Image courtesy of Juli Clarkson.

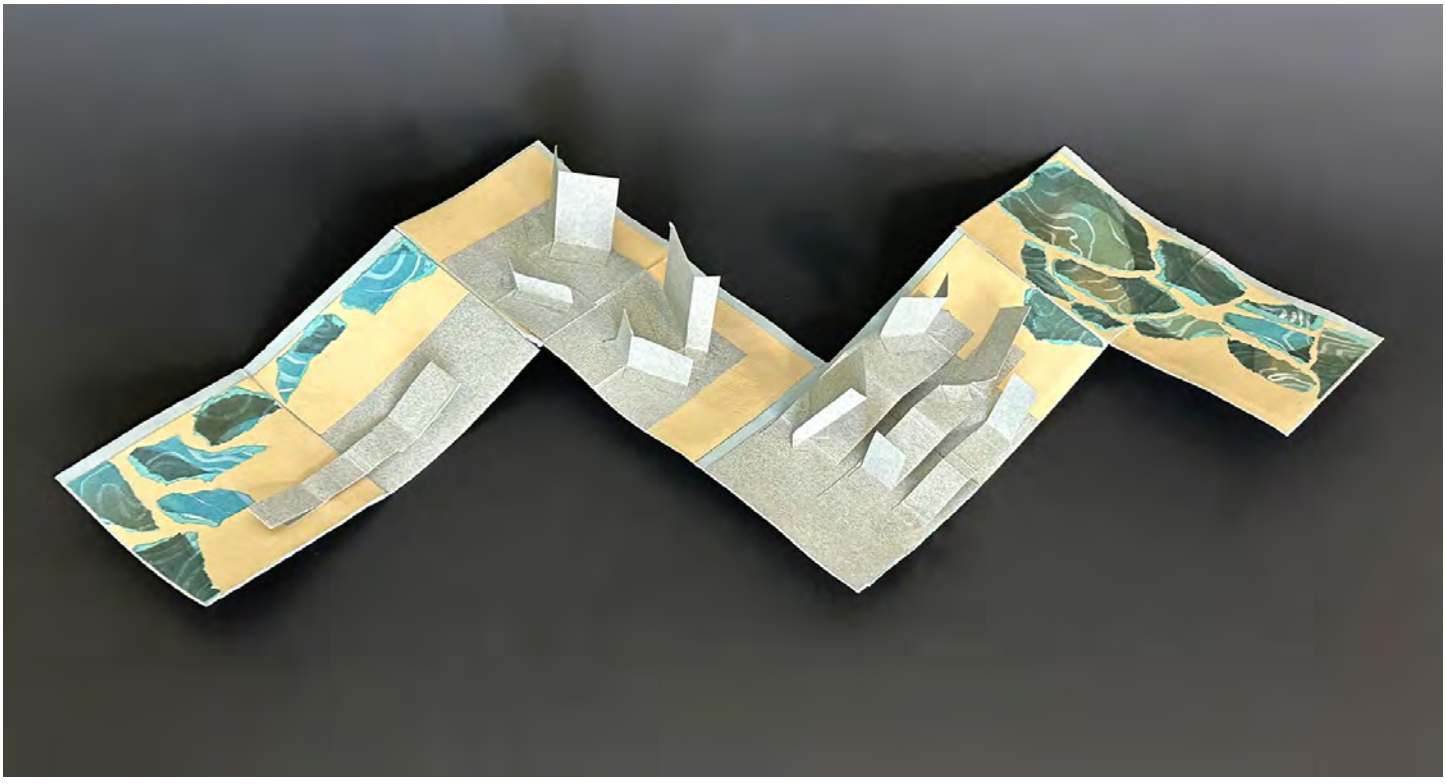

Figure 4. "Cycles (un)Changed," 20.5" x 9" opened up. Image courtesy of Sigma Colón.

Release

Artists' books' ability to function as mutable mobiles makes them ideal for making theory portable and conveying through material art what Gómez-Barris describes as a "fish-eye episteme," or way of knowing, that "reveals a submerged, below-the-surface, blurry countervisuality."[26] *Release*, Juli's second artist's book, engages with Gómez-Barris's murky, submerged perspective through the subversion of human touch. Artists' books depend on human interaction and touch to transmit information. Taking advantage of this dependence, the touch of the viewer becomes subverted to centralize rivers as agents of storytelling and lifegiving sources. Inspired by the wave of dam removals in the Pacific Northwest, including dam removal on the Klamath River, the contents of *Release* are contained within a cover illustrated to resemble a withering dam. A large crack—imagery inspired by the work of Mikal Jakubal—acts as the book's opening (see figure 5), forcing the viewer to take part in a dam removal themselves to access the book and river within (see figure 6).[27] The submerged fish become visible once the book manipulates human touch to become a force that aids in the release and restoration of a waterway historically controlled by watershed-colonialist processes.

By splitting open and removing the dam, the agency of the river within becomes central as the rushing and vibrant fish-filled waterway becomes accessible to the viewer. The accordion book structure composing the river, with its built-in peaks and valleys, emulates the rough and rocky currents that salmon and steelhead fight against during their spawning season (see figures 7 and 8). Born in freshwater rivers and streams and

Figure 5. Front of artist book "Release" by Juli Clarkson, 6.25"x 8", 2023. Image courtesy of Juli Clarkson.

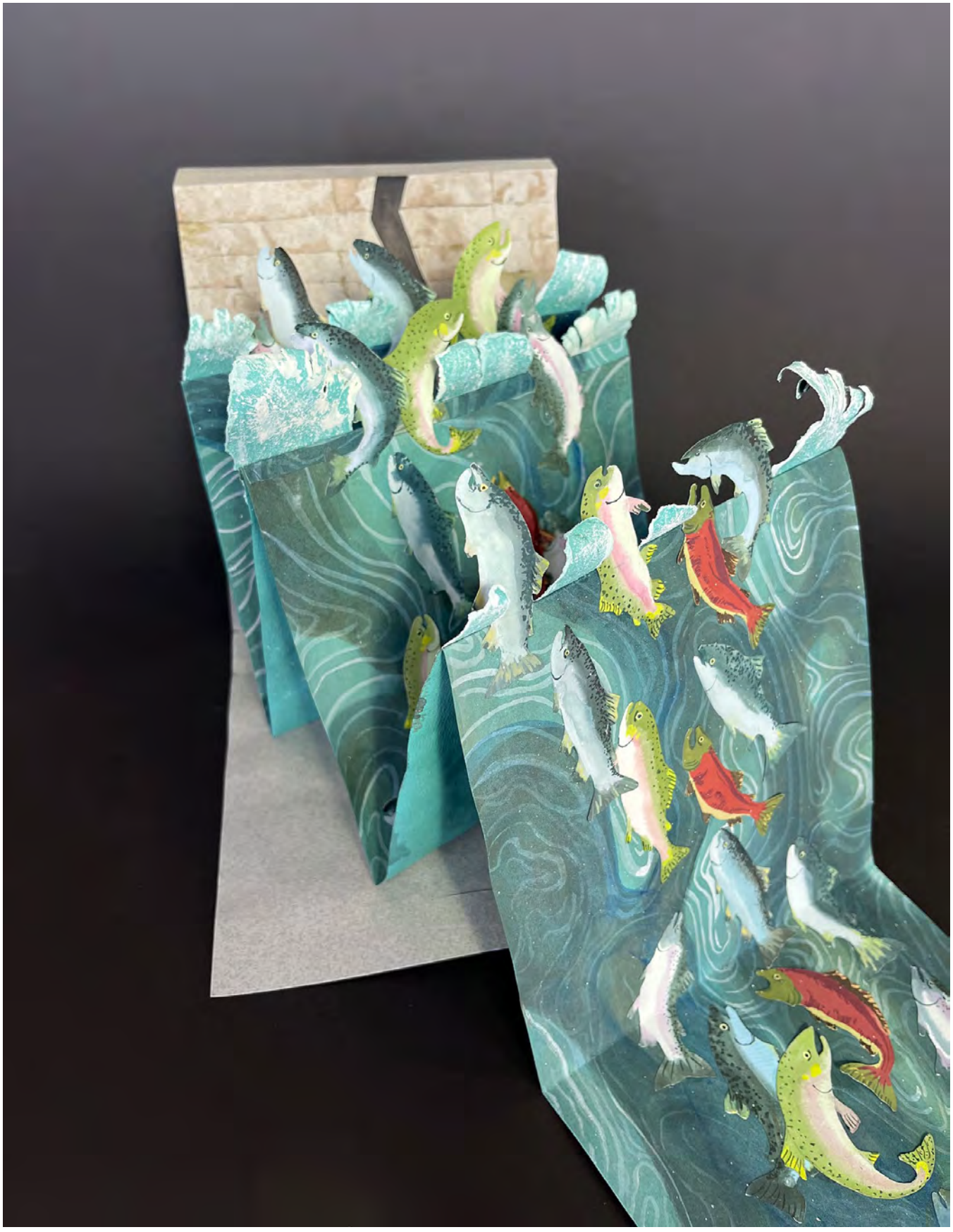

Figure 6. Dam removal captured in "Release." Image courtesy of Juli Clarkson.

then migrating to the ocean, Pacific salmon and steelhead return to the freshwater where they were born to spawn and begin a new cycle of life. Dam removal and river restoration supports the continuation of cycles previously interrupted by watershed colonialism. Once the river is released by the viewer of the artist's book, interaction with the previously submerged fish contents becomes possible, leading viewers "toward a deeper kind of looking" not only mediated by touch, but also engaged in a practice of observation and learning made possible by holding a simulacrum of the river close.[28]

Figure 7. Salmon and steelhead moving against the current in "Release." Image courtesy of Juli Clarkson.

Conclusion

According to Sara Ahmed, "in contemporary social theory, the primary motifs for the social are of fluidity," in part, because flows capture changes in social experience, "the fast speeds of late capitalism, the precarious conditions of labor, the loosening of social ties."[29] She warns, however, that movement metaphors can obscure the immobile qualities of institutions that not only refuse to change structures of power that reproduce injustice, but also mischaracterize people who challenge those structures as the real problem. Fluidity, malleability, and impermanence are key elements to our understanding of rivers as creative ecologies, but we recognize that it takes diverse aesthetic and activist strategies, Indigenous movements for water defense, and envisioning and knowing outside of a colonial mindset to not only shift how we see rivers, but to fight against the ongoing forces that relegate our lifeways to little more than extractive zones.

Footnotes

[1] Macarena Gómez-Barris, *The Extractive Zone: Social Ecologies and Decolonial Perspectives* (Durham, NC: Duke University Press, 2017), xix.

[2] T. J. Demos, Emily Eliza Scott, and Subhankar Banerjee, editors, *The Routledge Companion to Contemporary Art, Visual Culture, and Climate Change* (New York: Routledge, 2021), 2–3. This work challenges the peripheral place of the visual arts to the central concerns of environmental humanities and art history's delayed consideration of ecology.

[3] Michael C. Blumm and Dara Illowsky, "The World's Largest Dam Removal Project: The Klamath River Dams," *Oregon Law Review* 101, no. 1 (2022): 1–50.

[4] Sigma Colón, "Watershed Colonialism and Popular Geographies of North American Rivers," *Open Rivers: Rethinking Water, Place & Community*, no. 8 (2017), https://openrivers.lib.umn.edu/article/watershed-colonialism/.

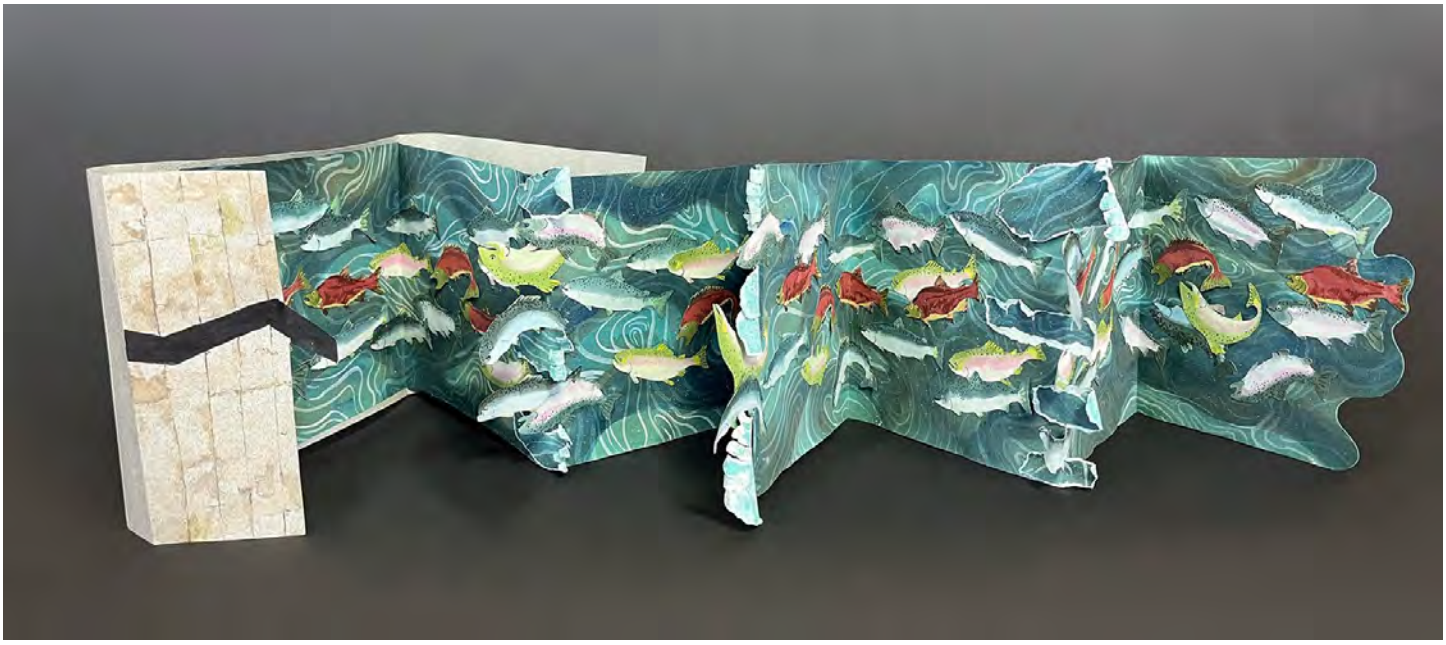

Figure 8. Accordion structure of "Release," 6.25" x 56" opened up. Image courtesy of Juli Clarkson.

[5] J. Kēhaulani Kauanui, "'A structure, not an event': Settler Colonialism and Enduring Indigeneity," *Lateral* 5, no. 1 (2016).

[6] For more information about grassroots activism on the Klamath River, see the Un-Dam the Klamath: Bring the Salmon Home campaign, https://bringthesalmonhome.org/.

[7] Anna V. Smith, "The Klamath River Now Has the Legal Rights of a Person," *High Country News*, September 24, 2019. For a list of countries that have passed rights of nature legislation, see the United Nations Rights of Nature Law and Policy, http://www.harmonywithnatureun.org/rightsOfNature/.

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FEATURE (PEER REVIEW)

BIG STONE LAKE STORIES: CROSSING BORDERS

By Jonee Kulman Brigham

Editor's note: This feature article has been peer-reviewed.

This is a story of an environmental art project called Big Stone Lake Stories that took place at a summer camp in 2018 in western Minnesota. Big Stone Lake Stories is an application of an Earth Systems Journey, which is a model for guiding participants into greater interconnection with their environment. I developed the model in 2011 as part of my environmental art practice and graduate work in liberal studies exploring the intersection of art, story, and infrastructure. Earth Systems Journey is foremost a form of participatory public art and secondly an environmental education curriculum model. Big Stone Lake Stories is one of over a dozen applications of the Earth Systems Journey model. Each application is adapted to the specific people, place, and program where it occurs, and with each iteration new insights emerge.

The concept of crossing borders is inherent in an Earth System Journey as it follows water infrastructure across borders of property lines,

Image by Brett Whaley via Flickr. CC BY-NC 2.0.

city boundaries, and watershed districts. In Big Stone Lake Stories, the theme of crossing borders took on added meanings prompted by the unique border-water geography of Big Stone Lake itself, which divides two states and sits near a continental divide, and the interpretation of borders in the composition of the journey experience. Other border-crossing themes emerged from the lived experience of the journey. In this first-hand account of the project, I bring my point of view as an artist and journey guide, as well as my own and others' reflections on our relationship to water and land and how Big Stone Lake both connects and separates us. After introducing the Earth Systems Journey model, I describe the Big Stone Lake Stories project from initial planning stages through the journey itself and conclude with reflections about the project. Rather than offer a comprehensive description of the camp planning and itinerary, I share highlights of the project and emphasize the role of literal and conceptual border crossings.

The Earth Systems Journey Model: Infrastructure as Border-Crossing

The mission of Earth Systems Journey is to "help youth connect and contribute to the world around them" (Brigham 2014). As defined on its website, an Earth Systems Journey (ESJ) is

> a curriculum framework for art-led, experiential, place-based environmental education about environmental flows, (such as water, air, energy or material) through the school building and grounds. ESJ is an approach that teaches ecological and environmental content, principles, analysis and decision skills in way that shows how human-engineered systems are integrated with natural systems. At its core, the design of an Earth Systems Journey is to make a special journey starting from a place of personal experience, following a flow of interest to its source and destination, as far as you can, so that when you return to where you started, your view of that place and its flows is transformed by knowing the larger story that runs through it and the places, and people and natural elements that live in relation to it. What makes the journey "special" is its composition as a transformative experience paying attention to props, interactive and expressive activities, participatory storytelling, and time to reflect and integrate the experience into a personal story. By using the natural learning form of story, complex systems can be made both engaging, and comprehensible. (Brigham 2014)

While an Earth Systems Journey can explore any number of resource flows, this article refers to the exploration of water, which was the resource of interest for the project described.

An Earth Systems Journey is based on the insights of systems thinking and the power of story specifically informed by the concept of a "hero's journey" as defined by Joseph Campbell ([1949] 2008). The primary insights from systems thinking that the model seeks to reveal are that everything is interconnected and interdependent, even though our modern life often conceals those interconnections. For example, tap water appears to come from the faucet and disappear down the drain, but it is really a hidden thread of connections across upstream and downstream water infrastructure and landscapes. It is at this point of water use, such as water pouring from a faucet into a sink, that the journey and story of water begins for participants in an Earth Systems Journey.

The design of the journey is based on the structure of the Hero's Journey and is adapted

to create a quest to discover how water interconnects our human environment to all the surrounding human and natural landscape, as shown in Figure 1. The names of the design elements shown in the diagram are not shared with participants, but rather are used to form a common language for the team designing the journey or reflecting on its design. The journey begins at the top of the circle, at the "home place," usually a familiar learning environment to the participants, such as a classroom or camp facility. Within the home place is a designated "flow node," a point within the home place that is familiar and used by participants and which will be the focal point for the journey. This is often a classroom sink, a drinking fountain, or, if following stormwater, a storm drain in a school yard. As in a Hero's Journey, there is a call to adventure, often in the form of a question like "Where does the water come from and where does it go?" This launches the journey and, after a preparation phase to gather tools, knowledge, and build anticipation, the journey is initiated by traveling to a location upstream of the flow node to follow the flow of the water. This represents the first major border crossing of the journey.

Border crossings are a key part of the hero's journey structure—whether physical or conceptual. In an Earth Systems Journey, border crossings are major turning points in the experience, as shown in the horizontal line in figure 1, and represent crossing from the familiar human-centered world to the unfamiliar world centered on water flows across a landscape and through infrastructure. Additional border crossings continue after joining the water on its journey through the landscape as human-made and natural infrastructure cross jurisdictional and conceptual borders, bridging the flow of water as it travels across property, city, and watershed boundaries. As the water flows, it also crosses conceptual borders as its identity as a river or lake or aquifer transforms into an identity as commodified water, pumped, moved, treated, measured, delivered, and sold to a customer. At the bottom of the circle, another conceptual boundary between upstream and downstream occurs at the flow node; for example, in a sink, this conceptual boundary is crossed in the short stretch of water between a faucet and a drain.

At the left of the circle, the "arrival" stage marks crossing the border again to return from the exploration of water flows to the home place where the journey started. Then to complete the journey composition, participants must integrate the story of what they learned and take some action to bring value from the journey back to their community, represented by the "remember and respond" phases in the diagram. These final stages often take the form of participants sharing the story publicly and conducting a service project to embody their identity as water stewards.

Fig. 1. Earth Systems Journey Model. This diagram of the Earth Systems Journey model is inspired by Joseph Campbell's concept of the Hero's Journey ([1949] 2008). The Earth Systems Journey model was first published in 2012 under the original name "Systems Journey." Image courtesy of Full Spring Studio, LLC.

Project Invitation and Research

After exploring the Earth Systems Journey website in early 2018, Don Sherman, a Big Stone County artist, teacher, and farmer, invited me to work with him in an art residency that summer to engage youth with Big Stone Lake and regional water issues. He'd been looking for an artist that could help integrate art, science, and water stewardship from an interdisciplinary perspective. As a place-adapted model, an Earth Systems Journey always involves gaining an understanding of local hydrological and cultural history which shape the composition and storytelling of the project. This research also serves to engage local experts and residents.

Big Stone Lake forms the lower edge of the "bump" on the western border of Minnesota as shown in the key map in the corner of figure 2. At a glance, it looks like a river as so many curvilinear state borders are, but it is actually a lake—a long string bean of a lake, 26 miles in length and a mile wide. But Big Stone Lake used to be a river. About ten thousand years ago, Glacial Lake Agassiz covered parts of what are now Minnesota, North Dakota, and Canada. It was an inland sea that spanned roughly 123,500 square miles and made huge impacts on the land. Over time, as pressure built up along the southern edge of Lake Agassiz along the continental divide, it pushed through the earthen dam creating what is now called Traverse Gap and releasing the powerful Glacial River Warren. Warren gushed forth with such force and volume that it carved out the entire five-mile width of the Minnesota River Valley, including what is now Big Stone Lake. As the glacial lake drained, the water flow reduced,

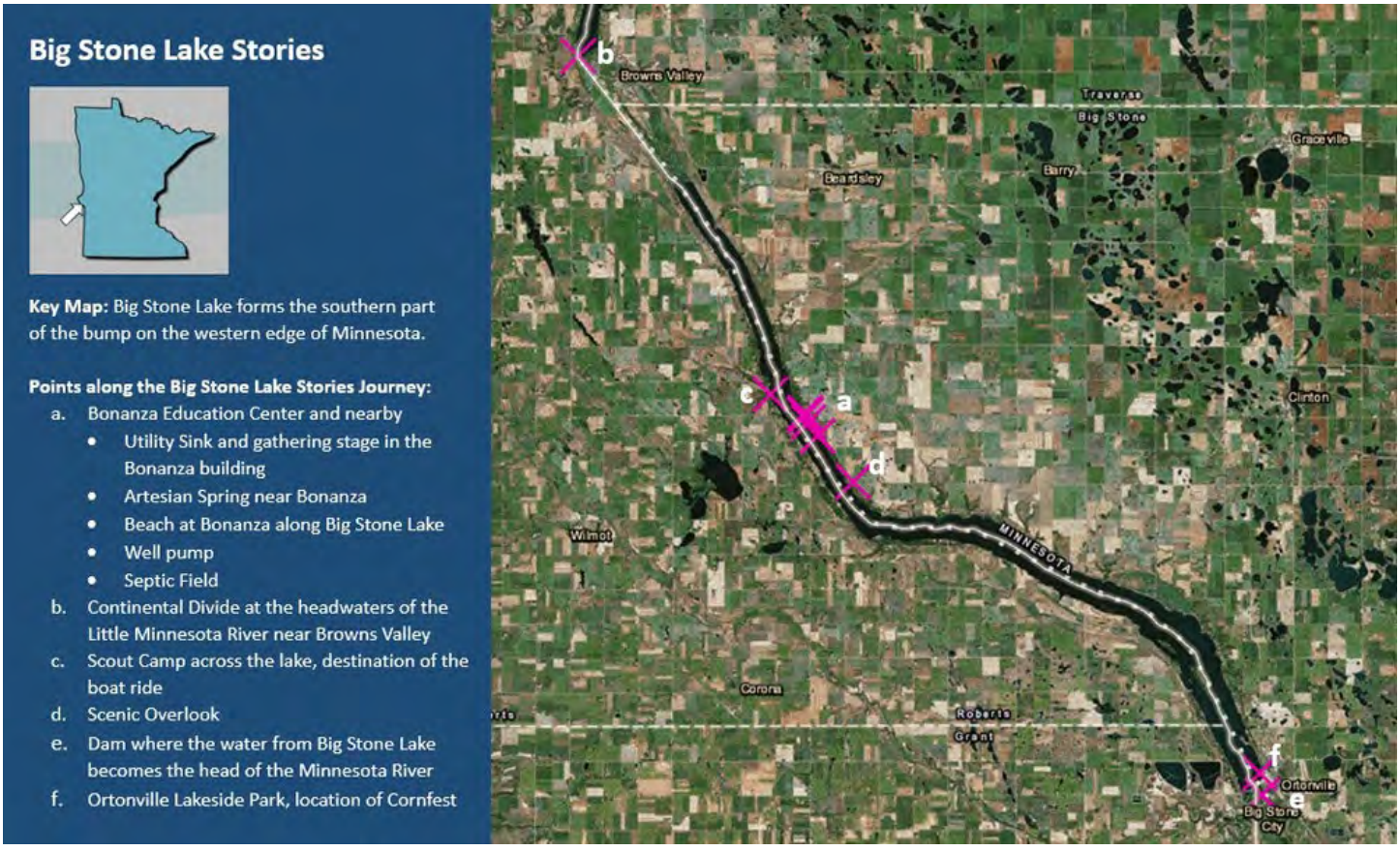

Figure 2. Big Stone Lake Stories Map. Image courtesy of Jonee Kulman Brigham.

leaving the valley that flanks Big Stone Lake and the Minnesota River (Ryan Bjerke, pers. comm. April 28, 2023, Minnesota State University 2023, Big Stone County Historical Society 2020).

As a border water between Minnesota and South Dakota, Big Stone Lake draws residents and visitors from both states to its shores. The difference in governance and identity across state lines is countered by a common interest in the lake and its welfare. Citizens for Big Stone Lake, for example, is an organization that represents common interests from both sides of the border. Both sides of the border also include fertile farmland. Big Stone County is over 70 percent farmland, and its largest crops today are soybeans and corn (Minnesota Department of Agriculture). The lake attracts tourists and offers camping along its shores at Big Stone Lake Park and abundant fishing opportunities (Explore Minnesota).

Historically, Big Stone Lake and the Minnesota River into which it flows were also home to the Dakota people. These same waters became tools of border-making between the tribes and the United States, used in multiple cession treaties that increasingly diminished Dakota land. Ultimately, the Dakota Expulsion Act of 1863 eliminated all reservations for Dakota in Minnesota (Minnesota Historical Society). Through the treaty of 1867, the Lake Traverse Reservation west of Minnesota was established for the Sisseton and Wahpeton bands of Dakota, 22 years before South Dakota became a state (ehistory.org). The reservation is mostly in northeastern South Dakota, just across the border from Minnesota.

Project Design and Planning

The design of the camp responded to the hydrology, cultural history, and geography of the area. The scale of Big Stone Lake dominates and defines the areas around it, and it naturally became a focal element of the journey design, both as a body of water and also as a border water. Big Stone Lake is a waterway of transitions across borders between rivers from its head to its mouth, and between states along its centerline which is the border between Minnesota and South Dakota. As a way of knowing place, the design of the journey took on a practice of border crossings, some planned and some emergent through the experience of the camp. Big Stone Lake's border identity is most obvious spatially in its current role as a border water, but the border-water identity also has roots in history, before Minnesota and South Dakota became states. Even further back, the dramatic story of the Glacial River Warren breaking through the edge of Lake Agassiz along the continental divide marks a turning point in hydrologic history and is the founding border crossing that creates this lake-river landscape.

Understanding the cultural history of the place influenced the formation of the team, the inclusion of perspectives, and the recruitment of campers, with participation of teachers and students from the nearby Tiospa Zina Tribal School. Throughout the planning there was an emphasis on using this project to strengthen connections between local artists, local experts, local youth, and the community to build capacity for continuing these kind of projects. Thus, the team of collaborators grew, each with a voice to share about the places we visited or the ways we explored those places through culture, art, science, and stewardship.

Most of the project team convened for pre-camp planning in July 2018. At this time, I had my first contact with the beautiful, slightly green waters of Big Stone Lake and with the places that would form the elements of the Earth Systems Journey

as shown on the map of figure 2. The home place was Bonanza Education Center (BEC), located midway along the eastern shore of Big Stone Lake, where campers met each morning of the week-long camp. Within BEC, the flow node that would launch the journey to follow water was a utility sink in the lower level and a gathering stage nearby. Special points of interest on the upstream portion of the water story included the continental divide at the headwaters of the Little Minnesota River, an artesian well where the ground water rises from the earth, a well pump at BEC, and the pipes leading to the utility sink. On the downstream side, significant points of interest included the septic system, the Big Stone Lake beach at BEC, a boat ride across the lake, an overlook part way down the lake, and the dam where the water from Big Stone Lake becomes the head of the Minnesota River.

Circulating the opportunity through local networks, the team focused on recruiting middle school youth interested in the combination of arts, science, and the outdoors. We also encouraged participation from youth who might not be able to afford a summer arts camp without support (which we were able to offer). The local 4-H chapter managed the registration. In all, we had 21 participants, most of whom were aged 10–12. Six of the campers were Indigenous and recruited through connections with Tiospa Zina Tribal School.

Fig. 3. Campers gather on the wooden stage that was the home base of the journey in Big Stone County, Minnesota, 2018. Image courtesy of John White.

The Journey

Like all Earth Systems Journeys, we designed the camp so that campers would participate in a week of art and education activities that involved appreciating and learning about the interconnected water system and the history of the place, while also connecting with local artists. This camp culminated in presentations to Citizens for Big Stone Lake, in engagement with community members and tourists at Cornfest (a local festival), in a website, and in an ArcGIS StoryMap featuring images, stories, and video from the week.

Day 1: Gathering and Engaging with Place

An Earth Systems Journey begins with connecting to place and each other, preparing for the journey, and being called to adventure. The first day of camp started with the typical camp activities of orientation and introductions. Campers received sketchbooks, colored pencils, and iPads for photography. The photographs were to stand alone as creative expressions but would also be used in a GIS StoryMap included in the project website, linked to locations and appreciations of Big Stone Lake.

Midmorning, we gathered in the lower level of the Bonanza Education Center in what would become our home place and reference point for the journey. While the utility sink in the basement had been chosen as the interpretive point for where water flows in the building (the flow node), it was in a small room which was not amenable to gathering. So we paired the sink with a ceremonial place to gather around water. As shown in figure 3, in the middle of the lower level was a circular wooden platform with inlaid patterns extending to the concrete floor around it in the form of a large compass rose. Above this wooden platform was a circular two-story space connected to the main level so that the platform had a sense of being a stage. This stage is where the Big Stone Lake Stories water journey began. Here, we gathered around an empty water vessel I had placed at the center next to an empty bucket and a ladle. As the Journey Guide, I introduced the quest for our water journey: to explore the water of the place, including in this building, and to learn where it comes from, where it goes, and how we can help protect the water. By the end of camp, we would share the story with the community so they could understand their local water connections, too.

To begin, we needed to connect to the water flowing in the building. A team of campers used the empty bucket to gather water from the sink in the nearby utility room and placed the filled bucket on our stage. In a ceremonial activity called *Words for Water* shown in figure 4, I invited each camper to scoop water from the bucket and pour it into the vessel at the center of the stage as they spoke some words about water, such as names for water, how they valued water, or questions they had of water. The ceremonial nature of this, with one camper conducting the ritual while the others listened in a circle, was intentional. We too often take water for granted, but this week we physically placed the humble water from the utility sink at the center of our story and honored our connections to water in all its forms.

After the water itself, our next guests were two representatives from Tiospa Zina Tribal School (TZTS) who are also members of the Sisseton-Wahpeton Oyate of the Lake Traverse Reservation across the lake in South Dakota. Mike Peters, director of Dakota Studies at TZTS, shared Dakota history and cultural perspectives,

Fig. 4. A camper participates in the participatory artwork, "Words for Water." Big Stone County, Minnesota, 2018. Image courtesy of John White.

connecting stories of Big Stone Lake with Dakota star teachings from caves downstream in the Twin Cities. Siyo Peters, human resources director from TZTS, shared Native poetry as she ladled water into the vessel. Like the often invisible and undervalued water of our places, Indigenous peoples are also too often ignored. Thus, our journey began with acknowledging water as well as Indigenous peoples and their original and continuing knowledge of this place.

After lunch we moved outside and unrolled a large canvas satellite map of the Big Stone Lake area on the ground as shown in figure 5. The only markings beyond the photographic record were the watershed edges. Campers used the forms and features on the map to try to find where they were and where they lived. We began adding to the map by stitching our current camp location with a red "X." Although the state border at the center of Big Stone Lake was not marked, the different timing of the satellite maps for each of the states hinted at the border, with the water abruptly shifting from algae green one side to a darker, clearer water on the other side of the border.

Cassy Olson, the coordinator at Bonanza, led the campers to the artesian well hidden in the woods that started a small stream leading to the lake. We followed the stream down to the beach where the campers had their first encounter with Big Stone Lake, wading into the water, skipping rocks, and making their own Big Stone Lake map in the sand. As they dug a long trench to represent the lake it filled with water from the

Fig. 5. Author and campers gather around the canvas map which is the basis of the "Land Markings" artwork. Big Stone County, Minnesota, 2018. Image courtesy of John White.

lake itself. There they were, using the lake and its shore to map the lake and its shore. Digging and drawing in the sand, like other nature play, is a great way to bond kids (and adults) to a place. Their marks become part of the environment, and by extension they do, too.

Part of the camp's purpose was to connect kids to artists and art activities. I introduced some of my artwork, pointing out that camps like this are part of my art practice. Then the campers met Don Sherman, the camp organizer, who also made paper from invasive plants in the lake, and musician Lee Kanten, who shared his new song about Big Stone Lake. Making paper with Don and music with Lee were threaded into the afternoons of each day, along with camp photography by artist John White, building relationships between campers and artists in their community.

Fig. 6. Campers participate in the "Continental Divide" ceremonial artwork with hydrologist Ryan Bjerke (center). Big Stone County, Minnesota, 2018. Image courtesy of John White.

Day 2: Upstream to Midstream Travels

On the second day, we joined Ryan Bjerke, area hydrologist from the Minnesota Department of Natural Resources, upstream at Browns Valley. After we pulled out our canvas map again, Ryan explained where we were and the important glacial history that happened here, where Glacial River Warren burst through an earthen dam releasing waters from Glacial Lake Agassiz that then carved the Minnesota River Valley and Big Stone Lake itself. We were also standing at the Laurentian Continental Divide. In a performative artwork called *Continental Divide*, we placed the map on the dividing line, and campers lined up on either side, pouring water in opposite directions, either bound for the Gulf of Mexico to the south or for Lake Winnipeg to the north. Further downstream, at a scenic overlook, campers could visually connect the story of River Warren to the vast valley below and imagine the glacial river at its peak: nearly five miles wide and filling the valley. They sat to sketch while Lee sang our lake song. Back at camp, Ryan showed maps of Lake Agassiz to complete the glacial story.

After exploring the expansive scale of hydrological history upstream from camp, we brought it back down to the place we'd started: where did the water for the utility sink come from and where did it drain to after use? Ryan showed cross sections of the landscape revealing the groundwater and aquifers below the surface.

Cara Greger, Big Stone Lake State Park assistant manager, joined us to show campers how water actually gets to our utility sink. Roughly 50 feet from the building was a well marked by a simple cylinder emerging from the ground. Removing the well cap, we peered down to the pipes and workings that drew the water from below. We went into the utility sink room to see the exposed pipes coming from the wall to the sink faucet. There it was: the water that was part of the hydrological cycle throughout the landscape was ultimately directly connected to the water from the tap.

We then considered the sink drain: where does the water go next? The waste pipes in the utility room disappeared below the floor. We went outside to see them travel slightly down the hill to where Cara pointed out a short cylinder protruding from the ground. This was the inspection pipe for the septic system. She explained that the dirty water and sewage drains from the utility sink and other water fixtures in the building and enters an underground septic tank where liquids and solids separate. Then the water moves into a drainage field and eventually safely returns to the local water system. The solids must be pumped out of the septic system every couple of years. The water in the sink came from the land and it returned to the land, and eventually the lake.

Midstream Reflections

That day, we traveled from miles upstream to our spot at the middle of the lake and we engaged with over ten thousand years of history. That was a lot to take in, and campers enjoyed relaxing with some kickball, paper making, music, and a closing circle as the day concluded.

It was a lot to take in for me, too, so that night, at my bed and breakfast along the lake, I walked down the stairs and sat at the end of the dock to center myself by the water. I grew up on (and in) a lake and I find that is where I feel most at peace. I have a friend who is also a lake person and we both recognize the lake-ache from being away from big water too long. We both have memories of childhood summers spent half underwater, with the sparkles and silver ripples above, and the blue-green muffled soundscape below. The surface of a lake is a magical threshold. Right at the edge on a dock, or with my head just above water, the lake envelopes me, calling me home.

That night, on the dock above the water, I thought about the lake's glacial history, the abundance of fish and rich soils that come from that history, its border identity, its central place in its watershed, its cultural significance to original and descendant Dakota people and settlers, and its personal meaning to me or anyone seeking the calm of its presence. How could a lake, that is also a river, be so many stories all at once? I let myself consider this in a poem I wrote on the spot.

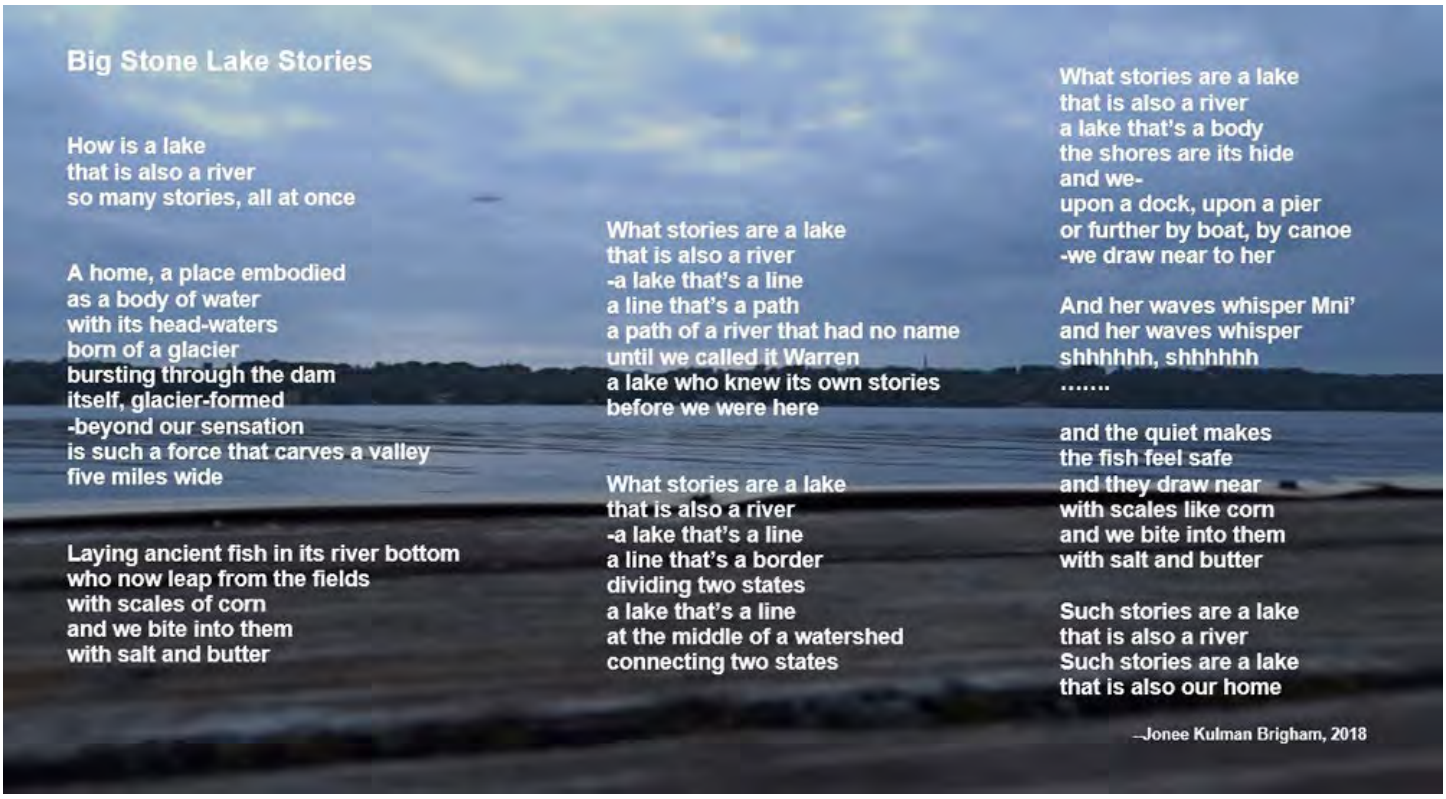

Fig. 7. "Big Stone Lake Stories." Poem and image by Jonee Kulman Brigham, 2018. Big Stone County, Minnesota. The composition was also published as a video poem, read by the author.

Day 3: At the Lake and Across the Border

The plan for day three was to have two groups: one half would stay back and learn about fishing while the other group would take a boat across the lake to explore the other side, including a scout camp. Then we'd switch and then we'd make art in the afternoon. The first group boarded the boat to cross the lake which also meant crossing the state border. I went with the first group in the boat that Lee was steering. As we were traveling across, I asked Lee to stop the boat. After writing the poem the night before, I realized that pausing halfway across the lake to

Fig. 8. Leaders (Don Sherman shown) and campers making temporary environmental art while stranded across the border from camp. Roberts County, South Dakota, 2018. Image courtesy of Jonee Kulman Brigham.

contemplate the invisible border crossing would be an opportunity to see the lake in more ways. Lee turned off the motor, stopping the boat halfway across and about midway along the lake's length. I recited the poem, being extra quiet at the part where the lake speaks, and the real waves seemed to *shhhhh, shhhhh* along with the reading. We all paused to absorb this quiet moment at the center of everything. Then Lee restarted the motor, and we proceeded to cross the border.

Now in South Dakota, we toured the Boy Scout camp, got a photography lesson from John White, and explored the shoreline as we waited for the boat to pick us up and return us to back to Minnesota. However, the boat didn't come.

Fig. 9. Campers on and around the dam at the point that divides Big Stone Lake from the Minnesota River. Big Stone County, Minnesota, 2018. Image courtesy of Jonee Kulman Brigham.

A part had broken on the motor and we were temporarily stuck on the west side. While we tried to calm the campers about being stranded, we also saw how very exciting this was to them. Somehow, being stuck across the lake from home just reinforced the lake's identity as a border place with two sides, and we were on the wrong one. We passed the time playing by the water, taking pictures, and making little land art sculptures. Finally, the repaired boat returned and we rejoined the rest of the campers.

Fig. 10. Many campers who had been "stranded" on the other side of the river, chose to draw that scene as one of their favorite parts of camp. Image courtesy of Jonee Kulman Brigham.

Day 4: Downstream and Reflecting on the Journey

The next day, we carpooled downstream to the other end of the lake to the dam that manages the lake elevation. We walked across it and stood at the center on the threshold of the lake's mouth and the start of the Minnesota River. A little downstream, we learned about the importance of inspecting a boat for aquatic invasive species so that we can all protect the water. We stopped at the pavilion by the south end of the lake and took some time to journal, practicing observing with all our senses and our emotions.

Back at camp, we began the process of preparing our water journey story to share with the public. We looked at photographs that campers had taken throughout the week and each student made a drawing about the journey from their own perspective. Some participated in paper making, and we all ended with music and a closing circle.

Although the camp was not focused on the theme of borders, a sense of the lake as a border-water emerged in some of the drawings, especially drawings by campers that had been stranded (see figure 10). Being delayed on our return had heightened the campers' sense of being across the lake from their home base at BEC. Each of the drawings prominently features the edge between land and water as campers depict themselves waiting for the boat. There is a tension

Fig. 11. Campers measure as they make designs for rain gardens they proposed at Bonanza Education Center. Image courtesy of Jonee Kulman Brigham.

of anticipation, waiting for the boat to come and allow them to cross back over the border. But the people—and even the underwater lake animals—all appear happy. None of the pictures showed the dashed borderline that is the official threshold between the states. Instead, the lake is a wide border place, a territory to travel across, inhabited by boats and, in one case, animals that dwell below.

Day 5: Protecting Water and Preparing Our Story

An Earth Systems Journey includes a stewardship project. Friday morning Adam Kleinschmidt from the Soil and Water Conservation Society came to camp to teach us about stormwater and how we can protect the lake by making a rain garden. Teams of campers collaborated to design the location, size, and plants to include in a rain garden. These designs would be considered by the Bonanza Education Center board as ways to improve the grounds.

On Friday afternoon the campers made final preparations for their community presentations. Some of the campers brought instruments and joined Lee Kanten to craft a lake story and musical performance. Some campers added stitching to the canvas map to highlight the continental divide and mark the places we went. Others made more paper or drew in their sketchbooks. During the afternoon, sponsors and friends of the camp arrived for a private rehearsal of the story and music performance. They joined the campers and camp leaders in a closing ceremony in the lower level where the camp began. Again, we poured water into the vessel at the center of the wooden stage. This time we shared our wishes and our gratitude for water as a way to end camp.

Fig. 12. Lee Kanten and campers share poetry, story, and music at the meeting of the Citizens for Big Stone Lake. Image courtesy of Jonee Kulman Brigham.

Day 6: Community and Cornfest

An Earth Systems Journey culminates with the participants returning from their adventure with a story to bring back as an offering to their community. On Saturday morning, campers and leaders presented the story of the project and performed music at a meeting of the Citizens for Big Stone Lake. Citizens for Big Stone Lake is made up of local people from both sides of the border who share a common interest in the well-being of the lake and promote and implement conservation projects.

Afterward, we headed off to share the project story with the wider community at the annual Cornfest by the lake in Ortonville. Begun in 1931 as a way to boost community spirit, Ortonville's annual Cornfest features a corn feed, a parade, music, and other community activities and displays (City of Ortonville). At our booth along the lake, we offered activities that brought the camp's water stories to the public. Visitors could stitch their favorite place along the lake on the *Land Markings* canvas map, and they often shared the

Fig. 13. A Cornfest visitor makes a stitch on an island to mark their favorite place on Big Stone Lake as part of the interactive "Land Markings" artwork. Big Stone County, Minnesota, 2018. Image courtesy of Jonee Kulman Brigham.

stories of those places as they found the locations from landmarks and features. Visitors could scoop a ladle of water to pour in the *Words for Water* vessel, adding their appreciation to the water as campers had during the week. Don and a camper taught visitors to make paper from invasive lake weeds. We also invited the public to add their own Big Stone Lake Stories to the StoryMap by uploading pictures and observations from their phone. On stage, Lee and the performing campers shared the camp's water story and music.

After Camp Reflections

While some stories were written for the local paper and the website documents the camp, there is no single definitive nor comprehensive story. This article is just one possible selection of memories and how they intersect the theme of crossing borders. While the camp did not explicitly focus on borders, border themes are inherent in the Earth Systems Journey model and are prominent in the landscape and its history.

Reflecting on the project as a series of border crossings, I can see how those themes emerged in the ways students engaged. After the *Continental Divide* participatory art enactment, I noticed one girl's eyes light up when she made a personal connection, realizing that the sign by her grandpa's house that labeled the continental divide was part of this larger geologic and hydrologic story. Another participant wanted to do the stitching

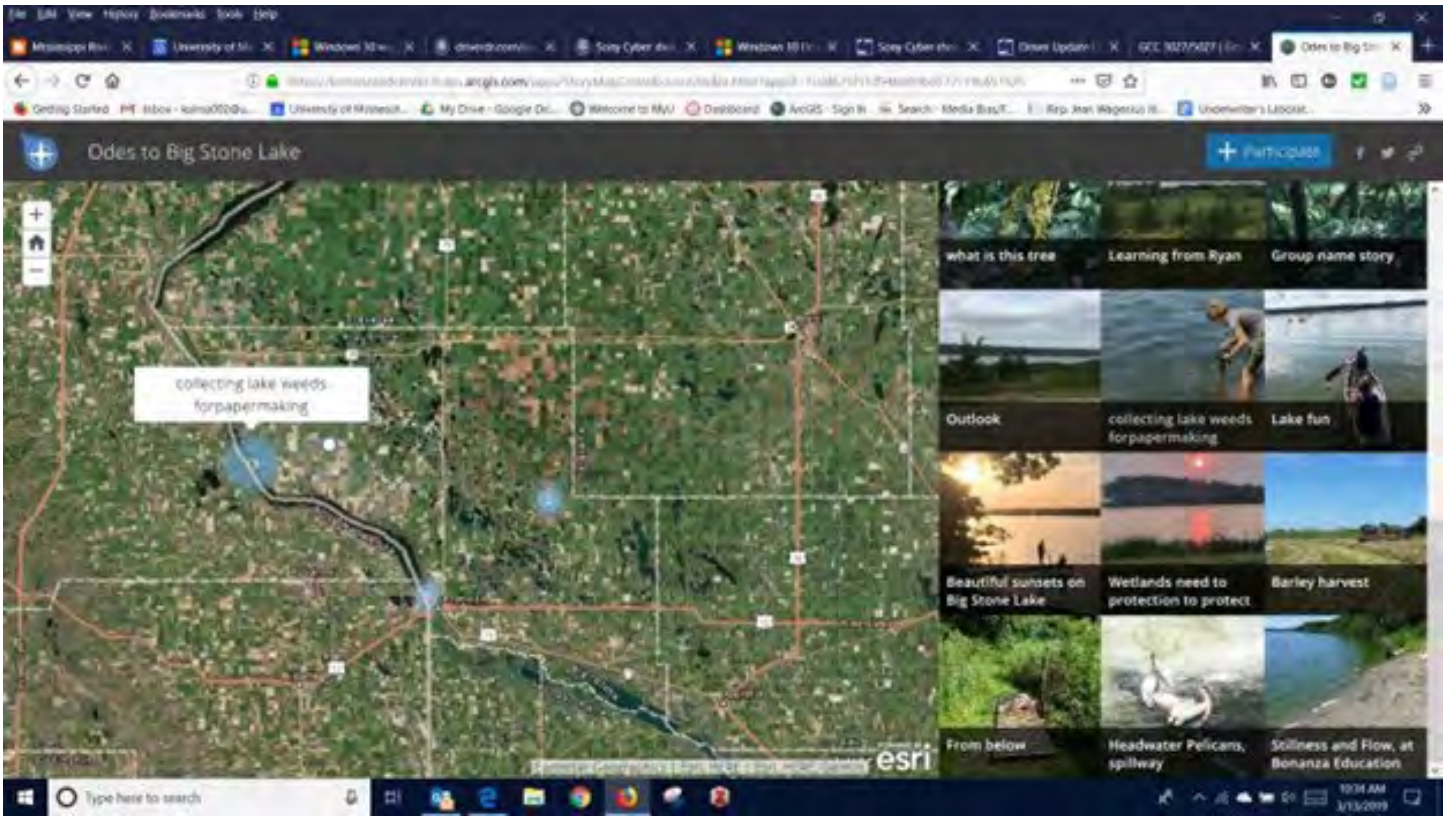

Fig. 14. Odes to Big Stone Lake. Screen capture of GIS StoryMap shows pictures and comments from campers and Cornfest visitors about Big Stone Lake. Big Stone County, Minnesota, 2018.

of the continental divide on the "Land Markings" artwork. Campers were particularly interested in the landscape at places of transition, where water itself crossed a boundary, such as emerging from an artesian well or passing over a dam. As shown in the earlier drawings, their own border crossing on the boat, and the complications with its return, was a particularly dramatic experience of the lake as a border.

Team Reflections

To reflect further on the border-crossing theme for this article, I asked the camp leaders about how Big Stone Lake and the Big Stone Lake Stories project both connect and separate.

Artist and project coordinator Don Sherman grew up in the area and initiated the camp with a motivation of connecting people to each other and to place. In an interview for the local paper, Don described how the need for social engagement was at the core of his goals for the camp (Dwyer 2018). He elaborated saying, "What I am most proud of is seeing the dial turn away from self and towards others…Our job as artists is to try to ensure a future by discovering pathways to the power of connection, imagination, and social engagement, where science and art combine to form a healthier and more able society" (Don Sherman, email to author, July 7, 2023).

Hydrologist Ryan Bjerke played a central role in helping campers understand the waters of the area, bringing enthusiasm for the stories the land and water hold. He shared many perspectives on both separation and connection. He saw geopolitical separation in the way the lake divides states, and the differing way those states apply water law, even on the same body of water. He also highlighted—as he did in camp—the significance of the Continental Divide that sends area waters either north to Hudson Bay or South to the Gulf of Mexico. The dam used to control water levels also separates a majority of the aquatic life and organisms from crossing the lake-river border. But Ryan also noted the way this water connects us to history, saying that it is a "direct link to the age of glaciers and the landscape-scale changes they wrought." He points to how the lake, as an aggregator of runoff, connects the surrounding natural and human changes on the land in a watershed that spans three states. Finally, he recognizes the recreation connection that so many feel for Big Stone Lake (Ryan Bjerke, email to author, April 25, 2023)

Jean Kanten, camp grant evaluator, is also a co-owner of Big Stone Lake Fish and Ride along with her husband, Lee Kanten. Their organization sponsored the camp boat ride. Jean reflects, "I can tell you that my experience with the lake has been amplified through my connection with the local nonprofit Big Stone Lake Fish and Ride. We take seniors, vets, people with disabilities, and others who have limited access to the lake out on cruises and fishing excursions—for free thanks to donors and volunteers. For me, that speaks volumes about what a connector the lake can be" (Jean Kanten, email to author, April 25, 2023). In contrast to experiences on either side of the border lake, Jean speaks to being on the water itself and how that enhances a human-lake connection.

Like Jean, Lee Kanten's reflection focuses on the connecting qualities of the lake. His bond with the lake was reflected in his presence in camp, as well as in the song he wrote for it. His reflections capture a life of experiences with the lake, concluding with the camp experience itself:

I grew up on Big Stone Lake. Learned to swim down at the Pier. I've water skied the length of it. We used to swim the mile across it just to get a candy bar at Schmidt's Landing. I've walked the entire perimeter of it, hugging the shoreline up the Minnesota side to Browns Valley, then back

down the South Dakota side past Hartford Beach to Big Stone City and home to Ortonville.

Big Stone Lake is, to me, a supreme connector of people. It constantly draws our eyes and our cameras. It is peaceful and powerful. It is what we who live here really share. All that was evident during the event we put on at the Bonanza Education Center. Kids learned firsthand the cycle of water, the importance of it, the nature of it…they learned of their shared role in keeping our waters, including Big Stone Lake, clean. (Lee Kanten, email to author, April 25, 2023)

Remembering a Final Border Crossing

At the end of the camp, as the leaders and campers prepared for the community presentation and display with excited, nervous energy, it was harder for some of the participants to sustain their focus on the projects when there was a kickball field and the lake nearby. Were we forming a border between our idea of culminating activities and their more active natures?

The three older girls from Tiospa Zina Tribal School and I got into a little game that day. I'd offer an activity, and they would shift the conversation to the lake: "So when can we go down to

Fig. 15. Lee Kanten steers his boat to carry campers across Big Stone Lake. 2018. Image courtesy of John White.

the lake?" Repeatedly throughout the day, I heard variations on "Is it time to go to the lake yet?" We were all smiling throughout this exchange, but I could feel their longing for the water. They were stuck inland—across a border of my making—between stories of the lake and the lake itself.

Finally, late in the afternoon, after we'd done the closing ceremony with the water vessel, we all went down to the lake to say goodbye. It was a high-algae day and one of the boys remarked that it looked like green tea. That didn't stop them. The campers took off their shoes and waded right in. The three older girls from the Tribal School did too, but they didn't stop at knee height. They kept going until only their heads were above the green surface, laughing and splashing each other. The borders were gone and they were at home.

Fig. 16. "Green Tea." A camper wades into the water, his legs disappearing below the algae-green surface. Big Stone Lake, 2018. Image courtesy of Jonee Kulman Brigham.

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Fig. 17. “Immersion.” Three older girls from Tiospa Zina Tribal School conclude their camp experience by immersing themselves in the water of Big Stone Lake. 2018. Image courtesy of Jonee Kulman Brigham.

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An Earth Systems Journey involves many partners, and this camp was no exception. The camp was made possible by a generous community of contributors. Don Sherman, project coordinator and paper artist for the camp gathered the team as well as the sponsoring organizations and worked with me as the guest teaching artist to compose the elements of the journey. Lee Kanten was the musical artist. Photographer John White helped document the camp as well as teach about photography. Cassy Olson, Bonanza Education Center coordinator, provided environmental education, and hosted the camp, coordinating with Suzanne Souza of 4-H to manage camp recruitment and logistics with the help of other partners. Mike Peters and Siyo Peters of Tiospa Zina Tribal School and members of the Sisseton-Wahpeton Oyate of the nearby Lake Traverse Reservation shared Dakota historical and cultural perspectives. Additional team members and presenters can be found at the Big Stone Lake Stories website, which was used during the project for recruitment and updates.

None of this would be possible without sponsors of the camp which included: Southwest Minnesota Arts Council/Legacy Fund, Big Stone Arts Council, Big Stone County Environmental Services, The Big Stone Lake State Park, Big Stone County Board of Commissioners, Big Stone Soil and Water Conservation District, University of Minnesota Extension, Big Stone County 4-H Program, Southwest Regional Sustainable Development Partnerships, Big Stone Fish and Ride, and Citizens for Big Stone Lake.

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About the Author

Jonee Kulman Brigham is an environmental artist and writer at Full Spring Studio, LLC in Maplewood, Minnesota where she makes art that explores the connection and flow between people and the rest of nature. In artists’ books, installations, and participatory public art, she uses story or a sequence of events supported by poetry, images, and ceremonial actions. Her Earth Systems Journey public art model is based on her belief that infrastructure, such as water mains and power lines, tells a story of how our daily lives are interconnected with nature—whether from a sink through pipes to the river or from a light switch through wires to the sky. Jonee is also an architect, senior research fellow at the Minnesota Design Center at the University of Minnesota, Institute on the Environment Fellow, and citizen-Earthling. While her work crosses boundaries, it is united by her concern for human-nature relationships. See more at Full Spring Studio.

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?"[1] 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."[2] They must seek ways to build, in Michael Simeone's words, "a framework for participation to supplement critique."[3] 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."[4] 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."[5] 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.[6] 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_3). 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.[7] 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 cutleries, 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

Robin 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"

Originally 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"

Growing 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 Frailing

Thriving in Complexity and Chaos

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

If 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?

On 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?

Throughout 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 predicating 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."[10] 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.[11] 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.[14] 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."[16] 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.

GEOGRAPHIES

NARMADA PARIKRAMA

By Vivek Ji

The waters of the Narmada River flow as though carrying a divine grace, ancient wisdom, and a sense of spirituality. This mystical river, known for its sanctity in India, has witnessed countless people embarking on a journey of devotion and introspection: the *parikrama*, a sacred circumambulation that spans the length of this majestic waterway. This circumambulation, undertaken by devout pilgrims, reveals the enduring legacy of the valley and is a testament to the unwavering faith and commitment of those who embark on the journey. The parikrama not only symbolizes their devotion, but also reinforces their spiritual connection with the valley and the significance of the river in their lives.

The Narmada Parikrama has been passed down through many generations, and I embraced it as the most challenging trip of my life. I was initially attracted to the sacred circumambulation because of the river's spiritual significance, but upon discovering the Narmada's various dimensions—social, cultural, economic, and archaeological—I now see the ways it contributes

The River Narmada in all her glory. Image courtesy of Vivek Ji.

to the foundations of Indian society and culture. As I have come to understand it, the Narmada River is more than just a spiritual river.

The Narmada Parikrama involves starting from any chosen point on the southern bank and following the river all the way to the estuary near Bharuch in Gujarat state of India. After crossing the river's mouth, the journey then continues along the northern bank back to the starting point. Traditional wisdom holds that the *Revakhanda* chapter of the ancient Hindu scripture *Skanda Purana* served as inspiration for the *Narmada Parikrama*.

Although the pilgrimage is quite demanding, it continues to gain popularity and attracts numerous individuals, including holy people (*Sadhus)* and laypersons, who travel from one sacred spot (*tirtha*) to the next each year. During each pilgrimage, pilgrims are required to carry out rituals that are unique to the local area and based on ancient stories and customs. The conditions and resources along the banks of the river are crucial for the Narmada Parikrama, ensuring that pilgrims can perform their rites, have food, and find shelter while traveling alone or in groups. Access to the necessary resources, however, has varied as the river has changed over time.

The author and others embark on the ancient pathways of the Narmada Parikrama. Image courtesy of Vivek Ji.

River Narmada

To understand the value and the challenges of the Narmada Parikrama, we must first understand more about the river, its history, and its changes. The Narmada River "is the largest west-flowing river of India and one of the 13 prominent rivers of India"; the headwaters, called Narmada *kund* (pond) is a small pond at Amarkantak town in the Maikal hill ranges in the eastern part of Madhya Pradesh.[1] The Narmada River "forms the traditional boundary between North India and South India over a length of 1,312 km before draining through the Gulf of Cambey (Khambat) into the Arabian Sea."[2] The forest-fed Narmada is the most important source of water for drinking, irrigation, and hydropower in Madhya Pradesh and Gujarat states, and provides food, water, and livelihoods to 50 million people.

The transformation of the Narmada into this industrious river took time. The Narmada and its surrounding landscape were once spaces of tranquility and serenity, untouched by the chaos of contemporary society, where solitude reigned supreme. However, in the twenty-first century, the origin of the Narmada in Amarkantak and the surrounding area, once a peaceful haven has transformed to include a bustling city, adorned with towering structures, *ashramas* (holy abodes), and other establishments. In many areas, the trees have been cut down at an alarming rate, leading to a frightening decrease in forest size. The Narmada banks once boasted beautiful spots for birds to rest and the greenery of trees draping the landscape; they now have very little tree cover because farmers have encroached on the banks, cutting down trees to

Many participate in the sacred tradition of drinking river water as part of the Narmada Parikrama. Image courtesy of Vivek Ji.

Hazy sunshine reflects on a peaceful view of the Narmada River. Image courtesy of Vivek Ji.

make arable land. Within the last eight years, there has been a movement to increase tree cover, but unfortunately, the project failed because it did not involve local people or ensure their participation in providing care for the trees. One of the most challenging aspects of my own Narmada Parikrama was to locate shade along her banks. If this removal of trees continues, the Narmada could soon lose most of its forest cover.

As the Narmada River water levels increase, the banks, devoid of trees, are flooding and eroding. This poses a threat to the ancient and sacred sites located along the banks that are part of the Narmada Parikrama.

It is astonishing to contemplate how this metamorphosis came to pass. In the days of British rule in India, this land was deemed desolate, a barren expanse that only a handful of temple priests cared for, dutifully safeguarding the sacred source of the mighty Narmada River.

In the past, Amarkantak, the town at the origin of the Narmada River, had numerous winding waterways that added to the powerful Narmada's flow. However, with the development of this sacred landscape, these waterways have significantly diminished.

The deforestation is apparent here at the boundary of Madhya Pradesh and Maharashtra, where the Sardar Sarovar Dam's reservoir extends over two hundred kilometers upstream. Image courtesy of Vivek Ji.

From the mountains of Amarkantak, the river plunges hundreds of feet through a series of falls and rapids, then it meanders around the hills of Mandla, a town not far from where it originates, and eventually passes under the remains of the palace at Ramnagar built by the Gond tribal leaders who dominated the area in the sixteenth century. By this point, nearly 150 km through its journey to the sea, the Narmada has drained a large area of hilly terrain. Its rushing waters branch out into many different channels, between the river's forested islands and the black traprock peaks and ledges that rise in the river's center. No longer do the surrounding hills and dense vegetation conceal the horizon and the banks, extending right down to the water's edge.

The river is a continuous blue ribbon of water from Ramnagar all the way down to Mandla. In this stretch, during my own parikrama, I noticed the river was framed by towering tree-lined banks which are increasingly rare along the Narmada. Further south along the river is a crossroads of the Grand Trunk Road from Jabalpur to Nagpur below Mandla at Gwarighat. This crossroads not only served as a strategic location for trade and transportation, but also held historical significance during the British colonial era. In this era, the felling and distribution of trees from this area played a crucial role in fueling the growing demand for timber across various regions of India. As I witnessed, this area remains mostly deforested. The Narmada then descends from the hills and enters into a rich valley that stretches for more than 200 km and passes through the districts of Narsinghpur and Narmadapuram of Madhya Pradesh.

The Narmada, which is known as the lifeline of the states of Madhya Pradesh and Gujrat, flows through this valley, nourishing the fertile lands and sustaining the local communities. This is the beginning of the river's journey through one of the large alluvial plains that gives the river its distinctive character: alluvial plains alternating with steep gorges. Farmers grow various crops in the alluvial plains throughout India's four seasons, and it was here that the British found India's coal belt and established coal and iron mines near Tendukheda. Traveling this section of the Narmada will lead one to the cities of Handia and Nemawar located on the river's northern and southern banks, respectively.

The Narmada River then winds its way through the formidable Satpura and Vindhya ranges, as if it has been dutifully safeguarding these majestic mountains since time immemorial. Recent findings have shed light on the ages of these geological landmarks, revealing that the Vindhya Mountains have stood tall for a staggering 1.4 billion years while the Satpura Mountains, though slightly younger, boast an impressive age of approximately 1 billion years.[3]

The hills on each side of the river begin to converge again just before the town of Handia. The Narmada, having descended from the hills above Mandhata, then flows through the state of Madhya Pradesh for the next 160 km, with the Satpura Mountains to the south and the Vindhya Mountains closer to the north. The river flows from Shulpani forest, which is inhabited by the *Janjatis* (people living and sustaining themselves in the forest) at the edge of Madya Pradesh and subsequently enters Gujarat via the town of Rajpipla, flowing on to Bharuch about 300 km further downstream. As it enters the Gulf of Kambhat below Bharuch, the estuary reaches a maximum width of 25 km and drains into the ocean.

Narmada in Hindu Religious Scriptures

The varied landscapes and terrain that are part of the Narmada's journey to the ocean were also part of my journey, my Narmada parikrama. Throughout this journey, I reflected on the ways that the Narmada holds great importance in Indian social heritage and is one of the foundations of Indian society. The river is a site for offering to ancestors, offering charity, and self-realization. For example, the epic tale of the *Valmiki's Ramayana*, which chronicles the life of Lord Rama, the one of the divine Incarnation, shares the captivating narrative of Lord Rama's journey. It includes a glimpse into the enchanting world of the Narmada River and provides a meticulous account of the diverse array of creatures that undoubtedly inhabited the enchanting forests surrounding Narmada: tigers and lions alongside buffalo, deer, bears, elephants, and birds all coexisted harmoniously amidst the verdant foliage.[4]

Despite being mentioned in many ancient holy books, the ancient sacred sites of Koteshwar in Madhya Pradesh are now underwater and inaccessible for most of the year. For the few months of the year when they are visible, pilgrims travel there by boat to pray. Image courtesy of Vivek Ji.

From Valmiki's Ramayana to the Mahabharata to the Puranas, the Narmada appears time and time again as a rich and lush landscape, a site of blessing, redemption, and temptation, and as a nexus for holy pilgrimages. For example, the *Vana-Parva* of the *Mahabharata* serves as a guide for those embarking on a pilgrimage, emphasizing the importance of visiting specific *tirthas* (sacred pilgrimage sites) surrounding the Narmada to attain spiritual merit. In the enchanting chronicles of the *Narada Purana*, a vivid depiction emerges of the myriad *tirthas* on the banks of the Narmada River. These *tirtha* remain significant for pilgrims even today. One passage discusses the 108 *tirthas* or holy places of importance at each *sangama* (confluence) of the Narmada. During my own pilgrimage, I engaged with many of these *tirtha,* noting their spiritual significance in the past as a connection to the present and the future. Looking at these tirthas, or discovering them on my travels, is like reliving the stories, learning the past, and uncovering the significance of these holy heritage sites. The process is similar to that of archaeologists discovering priceless artifacts: heritage sites are like gems of history waiting to be discovered.

This Gond tribal fort is one of many important historical sites along the Narmada River. Image courtesy of Vivek Ji.

Historical Literature on the Narmada

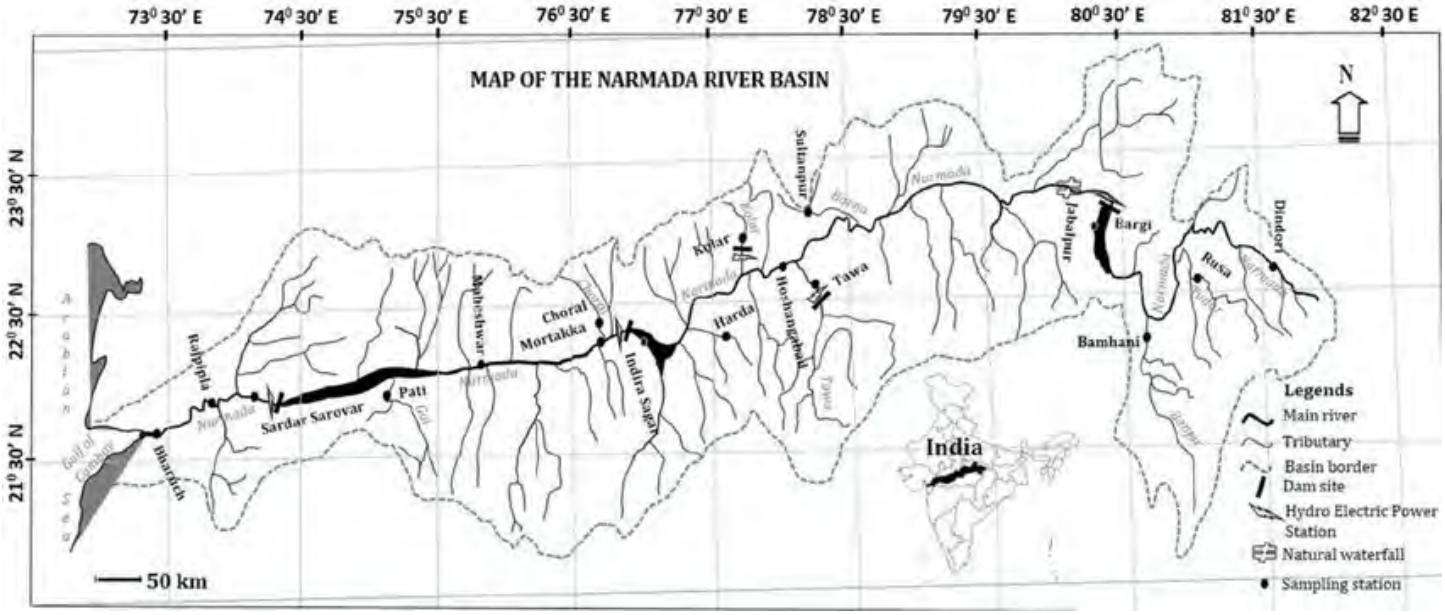
The Narmada River is held in high esteem not only in religious and spiritual books, but also in many works of literature. Mother Narmada, whose presence is described as "awe-inspiring" in Kalidasa's Raghuvansha is a real place.[5]

Bharuch, historically known as Bhrigukaccha, was an essential stopping point for adventurous travelers as they made their way across India. Crossing the mouth of the Narmada was one of the most difficult obstacles to reach the Bharuch, and as such, the crossing was frequently mentioned in stories about this bustling city.[6]

Even within the ancient manuscripts of the Krityakalpataru of Bhatta Lakshmidhara, one can find numerous references to the Mother Narmada. These books, meticulously crafted, bear within their pages to the names and *tirthas* associated with the Narmada.[7] This ancient manuscript, penned nearly a millennium ago, unveils a vivid portrayal of the majestic river and the enchanting land of Amarkantak. It leaves one pondering over the ethereal beauty possessed by Mother Narmada, a beauty so captivating that it enticed even those residing along the banks of the revered Ganges to embark on this spiritual journey along her hallowed shores.

Whether chronicled in written accounts or passed down through generations via oral tradition, the essence of the Narmada resonates deeply within the hearts and minds of its people. It is this resonance that drew me to the river, too, and into the Narmada Parikrama. I pursued this practice as a way of honoring the river and of connecting to these deep and rich histories.

Throughout the centuries, writers have been captivated by various texts that exist even after hundreds to thousands of years have passed. From Virasimha, the late sixteenth-century ruler of the town of Orcha, sharing insights on the river from his own expedition and engagement with earlier texts to Dalapatraya, a member of a royal family in the mid-1500s who penned 172 verses to the river, writers draw us into this place. [8] These texts, whether derived from ancient *Puranas* or inspired by the meandering path of the River Narmada, continue to hold a prominent place within the Indian cultural tapestry.



Map of the Narmada basin by Khedkar, Jamdade, Nayk, and Haimer via PLOS ONE at https://doi.org/10.1371/journal.pone.0101460. CC BY 4.0

Because of the dams, many sacred palaces and sculptures that line the Narmada River are underwater for much of the year. Image courtesy of Vivek Ji.

The Narmada River's Current State

The Narmada River I encountered during my Narmada Parikrama is both the same and different from the river captured in these spiritual and historical records. Nowadays, the Narmada River continues to flow, with numerous dams constructed along its course to fulfill the requirements of society for water and energy. The river now closely resembles a lake for most of her course as a result of these dams and other infrastructures that significantly alter the natural course of the river. As a consequence, countless ancient sites (sacred *tirthas*) have been submerged, and villagers have been forced to abandon their ancestral lands due to the rising waters caused by these dams.[9]

The Narmada River and its tributaries have been the subject of plans to develop dams of various sizes, with some plans calling for almost 3,000 small dams, 130 medium dams, and 25 big dams. The Narmada Valley Development Project currently comprises five mega-dams, with the four largest ones currently finished and in use. The Mandleshwar Dam is the sole dam that remains under construction, nearing completion. Collectively, the five dams are projected to inundate an area of around 1850 square kilometers. [10]

Not only have dams forced countless people from their homes, but they have also flooded numerous archaeological sites and culturally important *tirthas*. Tragically, not enough is known about the cultural loss of heritage in India. While on my Narmada Parikrama, I found that out of over 300 sacred sites mentioned in India's ancient texts, only about 200 are still intact. Among the rest, over 30 are inaccessible due to danger or are close to ruin, while the remaining 70 have vanished completely.

The reservoirs behind the dams significantly impact the Narmada Parikrama. Indira Sagar, the largest human-made lake near Punasa, has flooded an area of 913.48 sq km, resulting in the loss of a significant portion of the *parikrama* path. The Sardar Sarovar dam further downstream blocks a narrow and steep valley, leading to backwaters that extend up to 214 kilometers upstream. This has caused the disappearance of more of the original *parikrama* path, which spanned almost 430 km. The distance of the Narmada Parikrama is much longer now because of these changes; I estimated the contemporary journey to be around 3,000 kilometers, which differs from previous accounts that placed it at approximately 2600 kilometers, covering both banks of the river.

In order to avoid artificial lakes and sections of the ancient river that have been altered by regulation, pilgrims like me are following a significantly altered path. The reservoirs are now included in the pilgrims' route; the peaceful waters there are treasured just as much as the rushing waters of the original river.

Despite these changes, the Narmada Valley has recently been recognized as a unique cultural unit by archaeologists, art historians, and experts from related fields. In the annals of history, the true importance of the valley has remained shrouded in mystery until relatively recently, when archaeological discoveries shed light on its significance. These findings have revealed that the valley served as a hub for ancient civilizations, fostering cultural exchange and technological advancements that shaped the course of human development. It is only through the diligent efforts of archaeologists that the veil has begun to lift, revealing the valley's profound historical significance.

Numerous recent studies, both in the realm of scientific research and geographical exploration, have unveiled a captivating revelation: the Narmada Valley has been a site of uninterrupted human habitation for an astonishing span of

Sardar Sarovar Dam in Gujarat has a reservoir that runs over 200 kilometers, past the borders of Maharashtra and Madhya Pradesh. Image courtesy of Vivek Ji.

150,000 years. [11] In the vicinity of Hathnora (a village in Sehore district of Madhya Pradesh), a place of tranquil beauty where the Narmada River flows gently, an extraordinary revelation took place. It was there that the ancient remnants of a hominid skull, the oldest ever found in peninsular India, were unearthed.[12] Schoolchildren learn about the Java Man and the Peking Man, but the Narmada Man (as it is called) is almost unknown. The Narmada Human, originally known as the Narmada Man, is a member of the *Homo erectus* group that lived before contemporary *Homo sapiens sapiens*. The Narmada fossil could be 500,000 to 600,000 years old based on morphological features compared to other fossils from known antiquity, palaeomagnetic dating tests, and accompanying fauna.[13]

Damage to fossil research has occurred as a result of development initiatives including dams, mining and oil drilling operations, intensive farming, and population pressure. Across the subcontinent, hundreds of sites pertaining to palaeoanthropology and the Stone Age are being destroyed.[14]

Throughout my 3000-kilometer Narmada Parikrama along the river, I witnessed significant

The Devaptha Tirtha in Madhya Pradesh is submerged and unreachable for most of the year. During the few months it is visible, pilgrims make the journey by boat or by walking through knee-deep water to pray at the site. Image courtesy of Vivek Ji.

sand mining activities. This activity is crucial for preventing the dams from becoming clogged. Despite the ban on sand mining by heavy machinery in Madhya Pradesh, I noticed numerous sand mines continuing to use heavy machinery for extraction during my walks. This presents a danger to the fragile ecological balance and needs urgent action. There are individuals who have spoken up, but what is lacking is a fundamental change in the system so that rivers are appreciated as more than a resource.[15] A recent study found that the diversity of fish species is reducing at an alarming rate in the Narmada; one of the visible impact of sand mining is that in the past 50 years a total of 56 species of fish have been lost in the river Narmada in central India.[16]

The ecology of the Narmada, which was once celebrated in ancient Hindu scriptures, is currently deteriorating. The banks, once adorned with a variety of trees, have now lost their beauty and are in decline. Several banks have been cleared and trees uprooted for farming or sand mining, leading to significant soil erosion that poses a threat to nearby villages.

Analyzing the changes to the river, a recent study explains that

> the biodiversity-rich region has lost 11.63 percent dense mixed forest (DMF), 2.11 percent of sal mixed forest (SMF), and 5.08 percent of water bodies (WB) from 1980 to 2018, while open land (OL) area has increased by 7.52 percent; agriculture has further spread by 7.10 percent and the areas under human habitation/commercial buildings have increased by 4.18 percent.[17]

I initially wanted to do the Narmada Parikrama for spiritual reasons, but as I learned more about her history and the many references to her in Indian religious and spiritual texts, I began to see her as a river, but also as a cultural hub for the

Pilgrims traverse farmland that used to be forested but it is now completely cleared. Image courtesy of Vivek Ji.

social and spiritual development of India. I feel incredibly fortunate to have walked the full 3,000 kilometers, but my heart sinks whenever I think about the ecological destruction she is currently experiencing, the flooding of her old *tirthas*, and the disappearance of her traditions. Because of her serene beauty, the banks of the Narmada River were once the dwelling places of many philosophers and thinkers who contributed to the canon of Indian philosophy. However, as the river experiences ongoing transformation, these histories have all but disappeared. India as a nation continues to disregard the Narmada's history, as evidenced by the deterioration of its heritage sites. I wonder at this juncture what will happen to this river which is known as Mother Narmada and the great circumambulation known as Narmada Parikrama if the trends continue the way they are.

Footnotes

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[9] Dam construction began with Bargi, then Punasa, Omkareshwar, Sardar Sarovar, and finally, another dam near Mandleshwar that is nearing completion.

[10] The calculation of this figure is based on official information regarding the extent of submergence, which has often been found unreliable. The officially calculated numbers of villages to be submerged by individual dams were consistently lower than the actual numbers once the reservoirs were filled. Discrepancies may arise from efforts to minimize costs for resettlement/rehabilitation of those impacted by the dams. When all the proposed dams of the project are combined, they are estimated to submerge approximately 4000 sq. kms. For more information see, Arundhati Roy, "The Greater Common Good," in *The Algebra of Infinite Justice* (Penguin Books India, 2002), 43–141.

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About the Author

Vivek ji, a writer, poet, and foremost a humanitarian, founded the Ananda hi Ananda foundation to further the causes of spirituality, peace, meditation, and inner well-being. In addition to helping with river and water conservation, the foundation bridges the gap between the past and the future by preserving different parts of Indian culture. The two cities that Vivek ji frequently splits his time between are Delhi, and Nagpur (Maharashtra) in India. His most recent book, *Narmada Parikrama: Walking 3,000 Kilometers Along the Sacred Narmada River* recounts his journey along the river’s length.

IN REVIEW

ALL WE CAN SAVE

By Marceleen Mosher

All We Can Save: Truth, Courage, and Solutions for the Climate Crisis, edited by Dr. Ayana Elizabeth Johnson and Dr. Katharine K. Wilkinson, is an anthology for anyone looking to turn away from the brink of disaster and toward a life-affirming future for all of Earth's inhabitants.[1] The collection brings forward the feminist voices of people at the forefront of the climate movement, weaving together creativity and science through essays, poems, and art that face the existential threat of climate change head-on while illuminating a way out of our current mess with energy, humility, and a spirit of collective action. The reader is guided through an intellectual, cultural, and emotional experience of the problems of climate change across a myriad of perspectives and communities—from scientists and scholars to community activists and policymakers—leaving readers with a sense of inspiration and empowerment.

In eight thematic sections—Root, Advocate, Reframe, Reshape, Persist, Feel, Nourish, and Rise—these activists, scholars, farmers, policy-makers, and artists bring a fresh and vital look at the climate crisis that will help readers to name their despair (maybe nostalgia or eco-anxiety, maybe something else), connect to the soil beneath their feet, and give them a nuanced and interconnected perspective on an issue that touches every living thing on the planet. The

"All We Can Save: Truth, Courage, and Solutions for the Climate Crisis," edited by Dr. Ayana Elizabeth Johnson and Dr. Katharine K. Wilkinson, is an anthology for empowerment in the face of climate change. Image courtesy of The All We Can Save Project.

collection addresses the real-world impacts of climate change while acknowledging the differences in how individuals and communities around the world experience these effects. Unlike typical narratives of climate change that focus on a Western, often individualistic political or economic perspective that may evoke hopelessness, these personal stories inspire a sense of possibility, empowering readers with a sense of agency in climate activism.

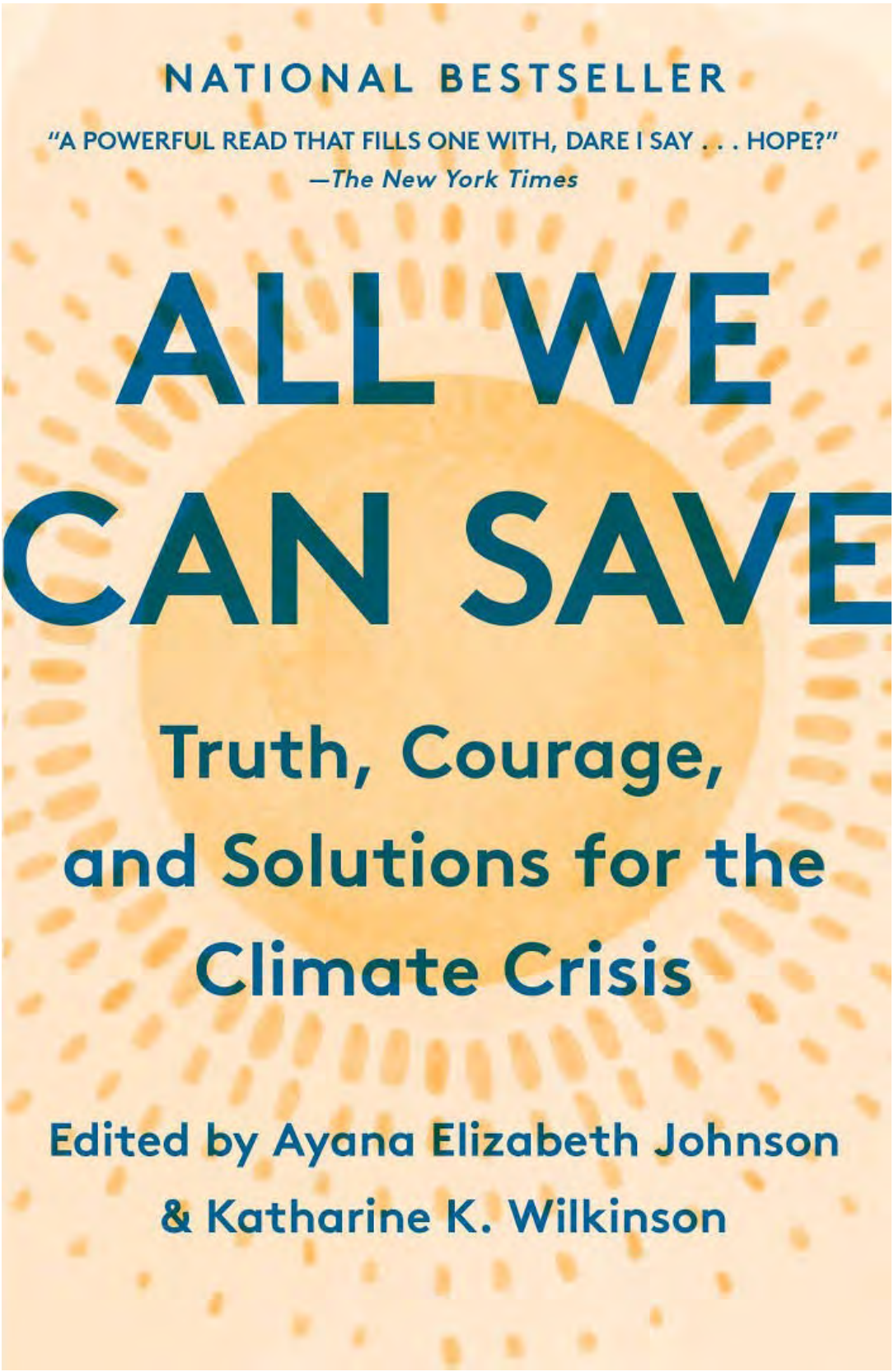
The anthology's main strengths lie in its diversity of perspectives and its focus on solutions. My work in the world of climate activism is largely centered on how we communicate about climate change and its impact on human health—I'm swimming in the academic and journalistic perspective. I've been reading works by Naomi Klein,[2] Katharine Hayhoe,[3] and Susanne Moser[4] for years, and their additions to this anthology are outstanding. However, it was the authors I'd never come across and the perspectives I was unfamiliar with that moved me the most—they reinvigorated my drive for this work. Favianna Rodriguez calls the climate movement out for leaving storytellers, artists, and people of color out of the major climate change narratives in "Harnessing Cultural Power." She makes her point with a powerful metaphor of stories as stars coalescing, becoming constellations, revealing patterns, and shining brightly to inspire others to connect dots and shift narratives—to disrupt what doesn't serve us. She calls on us to harness the power of culture for climate action, to pass the mic to artists and people of color and let the power flow. Kendra Pierre-Louis exemplifies this beautifully in her counter-narrative about climate change in "Wakanda Doesn't Have Suburbs," conjuring an image of a highly technologically advanced and sustainable society, a brilliant and beautiful alternative to what we've been conditioned to accept as inevitable—technology requires ecological destruction—and making it feel as though this alternative is within reach. And Rhiana Gunn-Wright energizes climate policy in "A Green New Deal for All of Us."

Consistent among these essays is the power of story, the power of imagination, and the power of each one of us—as ourselves and together—to confront climate change.

It is worth acknowledging that with a great diversity of perspectives in a text comes a greater degree of demand on its readers, especially those accustomed to a linear, single-narrative approach to writing. Those who embark upon this journey should do so with intentionality so as not to be overwhelmed by the number of authors and the variety of styles in the writing, but rather embrace the gift of such a broad view of this uniquely human (and messy) challenge we're all facing. I recommend that readers appreciate each essay as it is, whether it is written in a style you're accustomed to and already value or is something you're less familiar with. This style is purposefully fragmented—unified through the thematic organization of the essays—to diversify its voice.

In service to the agency they inspire in readers, the editors have curated and cultivated a wealth of resources on their website, allwecansave.earth, where they welcome "climate doers, thinkers, and feelers" to utilize a rich selection of resources. From a deep-learning program called "Climate Wayfinding" or resources to build climate advocacy within a community to resources for educators in their classrooms, these resources are meant to "nurture deep, sustained, and courageous climate engagement" for anyone, ensuring that the energy inspired by reading is supported by resources for action.

All We Can Save: Truth, Courage, and Solutions for the Climate Crisis is a prescient read for all. It's a clarion call for the climate action movement to embrace its intersectional nature and the strength of diversity, to center itself on empowerment, and to foster and celebrate collaboration. This collection of essays is a source of inspiration and can serve as a guide for all—especially those of us feeling a sense of powerlessness, hopelessness, or apathy. There is still much we can save and so much worth saving.



"All We Can Save: Truth, Courage, and Solutions for the Climate Crisis," edited by Dr. Ayana Elizabeth Johnson and Dr. Katharine K. Wilkinson, is an anthology for empowerment in the face of climate change. Image courtesy of The All We Can Save Project.

Footnotes

[1] Ayana Elizabeth Johnson and Katharine K. Wilkinson, eds., *All We Can Save: Truth, Courage, and Solutions for the Climate Crisis* (One World, 2020).

[2] Naomi Klein is a well-known investigative journalist who has written about climate change in multiple books. Her latest, with Rebecca Stefoff, is *How to Change Everything: The Young Human's Guide to Protecting the Planet and Each Other* (Tundra Book Group, 2022). To learn more visit her website naomiklein.org.

[3] Katharine Hayhoe is a climate scientist and author. Her book, *Saving Us: A Climate Scientist's Case for Hope and Healing in a Divided World* (Atria/One Signal Publishers, 2021), highlights strategies for communicating about climate change. To learn more, visit her website katharinehayhoe.com.

[4] Susanne Moser is a geographer and social scientist who edited *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change* with Lisa Dilling (Cambridge University Press, 2007). To learn more, visit susannemoser.com/research.communication.php or listen to this podcast episode: communicatingclimatechange.com/podcast/creating-a-climate-for-change-with-susanne-moser.

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Marceleen Mosher, MA, is a feminist and environmental communication scholar who focuses on critical examinations of environmental communication at the intersection of nature, well-being, media, and power. She enjoys researching and presenting on public media, water infrastructure, climate crisis communication, and environmental catastrophes. Her latest work, "Expressions of Healing: How Time Spent in Nature Can Heal," a chapter in the upcoming book *Transformative Power of Parks*, is due out in 2025. In her spare time, you can find her running, hiking, and paddling across the region, snuggling her three cats, or spending time with loved ones over a good meal.

PERSPECTIVES

FROM SYMBOL OF WISDOM TO INDUCER OF ANXIETY: THE GANGA DICHOTOMY

By Saloni Shokeen

The River Ganga, arising from the Western Himalayas and flowing through India and Bangladesh, covers an immense distance of 2,525 kilometers in totality.[1] The river is a pivotal source of water for most northwestern states of India, which rely heavily on the Ganga for agricultural and personal purposes. In addition to the river's existence as a crucial resource, it also has an important religious value. The Ganga has been associated with purity, regeneration, and

The Ganga at Varanasi showing the crowded and cluttered riverbank. CC BY 2.0.

piousness for centuries. In fact, this is the global image of the Ganga which gets reproduced in popular media worldwide. While this escalation of a river to such a stature is fascinating and a curious domain in its own, it conceals the politics of pollution and the degeneration of the Ganga that should be concerning at the present moment. The religious discourse that surrounds this river has overshadowed its ruin via anthropogenic activities in recent years. While the symbolism associated with the Ganga will continue to inform our consciousness for many years to come, it is important to recognize the material changes in the course of the river. These recent transformations in the Ganga have changed its symbolic connotations in an adverse way, producing the feeling of something called eco-anxiety. Some of the crucial questions that I seek to unravel in this essay are: How did the Ganga, the eternal goddess of piety become a site of horror and despair in the current times? To what extent can rivers, along with their current stature, serve as the markers of climate change?

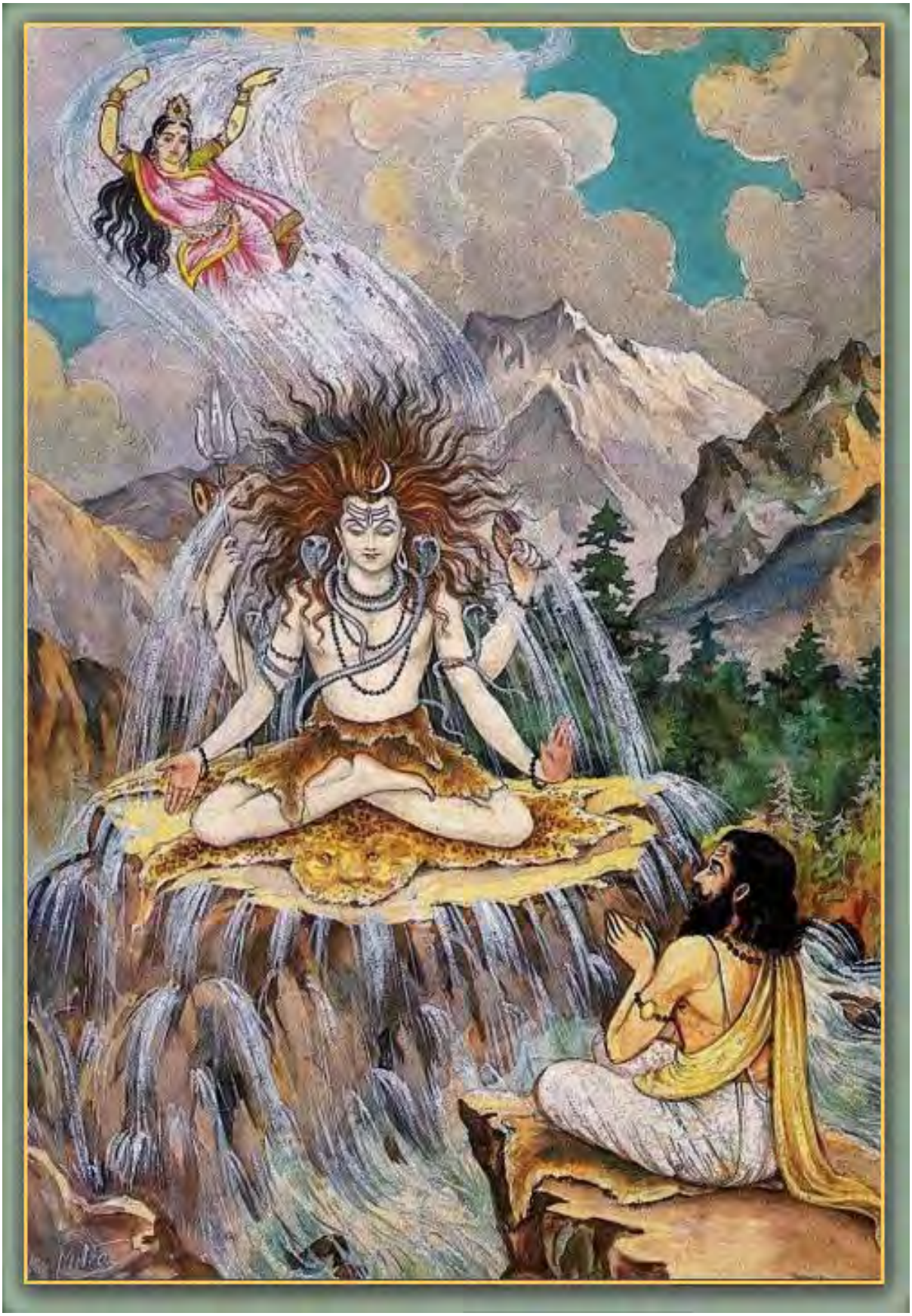
Religious Lineage

To comprehend the symbolic and literal devaluation of the Ganga, it is important to revisit the mythological lineage which has informed its historical religious value. I see the metaphorical and material changes in the composition of the Ganga as deeply connected. That is to say, the literary or cultural connotations carried by this river dissuade us from seeing its polluted reality. Yet, looking at the mythological origins is necessary as it can be used as a way to understand the contemporary degenerate existence of the Ganga.

The legend of Ganga begins with the rule of Bhagiratha who was a king of the Ikshvaku dynasty in 362 B.C.E. Also called the Suryavamsa or Solar Dynasty as they prayed to Surya or the Sun, the Ikshavaku had Ayodhya as their capital.[2] When being crowned as the king, Bhagiratha received the remains of his ancestors with the duty to cremate them respectfully. The need to attend to this responsibility grew stronger and forced Bhagiratha to leave his administrative duties and visit the mighty Himalayas. For him, *Moksha,* or the ultimate liberation of his ancestors, was the primordial duty. In the mythological tales surrounding this incident, Bhagiratha is said to have prayed to Brahma (god of creation), for thousands of years.[3] Bhagiratha's prayers were finally heard and Brahma advised him to appeal to Shiva, as only he could "tame" the Ganga's descent to the earth. The Ganga in this tale represents spiritual purity and transcendence from the endless cycle of birth. This explains the eternal association of the Ganga with the capability to "wash off" the lifelong sins of people. As Ganga was called to descend on the earth according to the myth, the gods were concerned about its force being unbearable to the planet. Hence Shiva, one of the main gods of the Hindu pantheon, had to help the situation by slowing down the pace of the river.

A work that best describes the descent of Ganga in a poetic manner is Amitav Ghosh's *The Hungry Tide* (2004), a work that is often regarded as Ghosh's experiment with geology and ecology.[4] In the early pages of the novel, Ghosh can be seen challenging the constructed boundaries between mythological knowledge and scientific discourse. He does so through the character of Nirmal, who embodies radicalism and is trying to find integrative methods for teaching his students. Nirmal's account of the Ganga is an interesting one as he states:

In our legends it is said that goddess Ganga's descent from the heavens would have split the earth had lord Shiva not tamed her torrent by tying into his ash-smeared locks. To hear this story is to see the river in a certain way: as a heavenly braid, for



Bhagiratha by B. K. Mitra.

instance, an immense rope of water, unfurling through a wide and thirsty plain. That there is a further twist to the tale becomes apparent only in the final stages of the river's journey—and this part of the story always comes as a surprise, because it is never told and thus never imagined. It is this: there is a point at which the braid becomes undone; where lord Shiva's matted hair is washed apart into a vast, knotted tangle. Once past that point the river throws off its bindings and separates into hundreds, maybe thousands, of tangled strands.[5]

While this can be dismissed as a fictional story that has been retold multiple times over the years, it also recognizes the river's agency. In other words, even though the masculine figure of Shiva tries to save humanity by "taming" the Ganga, its force is unbearable. This signifies that the river is ultimately uncontainable, both in mythological understanding and as a literal geological force. The River Ganga is an active and uncontainable presence in these mythological and religious stories, yet this can sometimes be misleading. Mythology thrives on essentialization or exaggeration of natural and human entities, omitting the reality. In this case, the overarching mythological tale that surrounds the origin of the Ganga overshadows the contemporary status of the river. In fact, the myth of eternal purity is circulated as a major defense by political and religious institutions. This makes people cling to Ganga's idealized image, which can never contain the whole truth underlying its existence. Inarguably, the river has undergone historical changes which have shaped and reshaped its geography. These changes, as they are hardly taken into account by popular culture and news networks, elude us. Hence it becomes increasingly difficult to foreground the current threats to the river.

COVID-19 and the Ganga

A significant recent example revealing this mismatch between the religious image and the reality of the river is the horror that ensued after the visuals of the Ganga surrounded by thousands of dead bodies came to light. During the second phase (also known as the Delta wave) of COVID-19 in India, the cases reached their peak. From April to July 2021, the reported cases went up to 20 million with a quarter million deaths, which shocked the nation to its core. [6] Many believe that the complete lifting of the lockdown and the restrictions related to it led to this unfathomable peak in the number of COVID cases.

While COVID-19 appeared to be under control briefly after its initial arrival, during this four-month period, it seemed completely out of control. Although the healthcare system was doing its best to help people, facilities soon ran out of oxygen, a vital supplement to combat COVID. As news regarding the devastated state of the hospitals was broadcast across the nation, it caused an escalation of fear and anxiety amongst people. The virus became an unstoppable force that was mercilessly taking the lives of thousands of people. As the number of deaths rose each day, it was impossible to guess when normalcy would return.

Amidst this gloomy atmosphere, pictures of the Ganga's banks covered with hundreds of dead bodies went viral. Providing the means for respectful cremation for those who were losing their lives everyday became impossible for two reasons: first, because in terms of physical space, there was less and less availability; and second, because paranoia about the virus and its spread peaked. Under these conditions, the families of the deceased were left with no option but to immediately discard the bodies of their loved ones. The question of a respectful cremation which would free the souls from the eternal cycle of painful births, a practice which was important

for King Bhaghiratha, was now an unachievable luxury. Instead, the Ganga was flooded with uncremated dead bodies wrapped in saffron cloth, a color signifying religious piety. Images of these bodies on the banks were first captured by Danish Siddique, who died recently while covering a conflict between Afghan and Taliban security forces.[7] Siddique's coverage of the dead bodies disposed at the banks of the Ganga were first circulated via Reuters in an article titled, "Bodies of COVID-19 Victims Among Those Dumped in India's Ganges."[8] This came out on May 15th, 2021 serving as one of the first acknowledgements of what was happening with the rivers of India's northern states.

The tradition of cremation has been central to the belief system that surrounds the Ganga, even though this practice pollutes the river in different ways. In Hinduism, the last rites include burning of the body by holy fire in the presence of the priest and family members. In the aftermath of this ritual the ashes are scattered into the Ganga along with flowers and garlands. Sometimes the family members also immerse the clothes of the person who died as a symbol of returning their soul to river and nature. In most cases,

Manikarnika Ghat is one of the holiest cremation grounds along the Ganga. Image by Dennis Jarvis via WikiMedia Commons. CC BY-SA 2.0

this practice is performed on the banks of the Ganga; the practice ultimately pollutes the river basin and affects life beneath the surface water. Deeply rooted in religious beliefs that have been strengthened for centuries, the practice is difficult to question and the damage it ensues is difficult for people to see. In the midst of the religious and industrial pollution that the Ganga is subjected to, the river continues to be an icon of immortal purity. In light of this, the adverse material changes in the river and its ecosystem are rarely recognized as serious problems worth consideration. Even when the damage done to the Ganga is taken into account in policies for its preservation, the impact of human activity is diminished. Nothing can come close to touching the Ganga and if it does so, the river, according to religious logic, is capable of healing and cleansing itself. Although this religious logic retains the cultural image of the Ganga, it overlooks the river's polluted existence.

Sewage waste that remains untreated is one of the primary causes of pollution to the Ganga. This comprises human and industrial waste, a form of pollution which is exacerbated by increasing population density along the river's banks. Industrial cities that are built on the river or close to it, including Varanasi, Patna, Kanpur, and Prayagraj, contribute to intensifying the problem of waste creation and accumulation. Industries and institutions, such as distilleries, slaughterhouses, textile factories, chemical plants, schools, and hospitals, continue to threaten the Ganga's waters. A report published by the Indian Department of Water Resources, River Development & Ganga Rejuvenation foregrounds the specific sources and causes of Ganga's water deterioration arguing that 75–80 percent of the pollution comes from municipal sewage nearly 37 billion liters of untreated sewage flows into the river daily.[9] The remains of cremated bodies adds another 300 metric tons of ash to the water system each year, leading to a severely polluted river.[10]

When it comes to developing policies to preserve the Ganga basin, the issue is heavily concealed and politicized. Since the Ganga informs the religious sentiments of millions of people, it is widely used as a political tool during campaigns by the top leaders of the country. Thus, it is not surprising that soon after global media platforms such as Reuters and the BBC showcased the horrific, bony-strewn images of the Ganga, there was no national coverage of this situation. Global media houses speculated that there was some intervention by the Indian government forces in concealing the news. Although there is no way to prove this possibility, these stories did not circulate for a long period of time. While the global media remained in sad shock with this news, it did not make it to the prime hours of the Indian regional and national media. Hence, not many people within India were familiar with what their precious river was going through. Both nationally and internationally, only a minority of people who have access to particular platforms were able to witness what was really happening. Even today, the event sadly remains unknown to the majority, and those who are aware of it often dismiss it as something unfortunate that will possibly never haunt their consciences again. This incident brings some questions to the forefront: Can we move past the image of Ganga as an eternally "pure" river and recognize the material transformations it has undergone? How does this incident defamiliarize the popular imagination of the river? And how does the anxiety produced by a case like this reshape our notions of the river?

Eco-Anxiety

The phenomenon of something called eco-anxiety, or ecological anxiety, is relatively new but a timely concept that captures the realities of our world. In an article titled "The Psychology of Climate Anxiety," Dodds explores the intricacies that differentiate climate anxiety from other forms of paranoia. Dodds foregrounds that anxiety induced by climatological changes and disturbing events that occur in the natural world has a profound impact on the human mind.[11] The rise in dystopian events and images of disasters in popular culture have forced psychotherapists and clinical psychologists to address the multidimensionality of eco-anxiety. Its exact source and impact are hard to pin down, since it manifests itself through a range of emotions. *The Handbook of Climate Psychology* tries to describe this issue best as "heightened emotional, mental or somatic distress in response to dangerous changes in the climate system."[12] So what is anxiety or climate anxiety? While being induced by different factors, it is primarily produced by adverse or unanticipated negative changes, especially those which are not controllable and those which can alter our lives forever.

Questioning the reality of climate change is not new and it continues to be negated in popular culture. One of the major reasons for this skepticism is the slow pace of these changes. This is coupled with the denial of the unpleasant feelings of uncertainty and fear that the unfolding of these shifts would produce. Although the Ganga's disturbing condition during the Delta wave of COVID-19 is not strictly an example of climate change, it nonetheless is capable of altering people's minds and belief systems in negative ways. In such a scenario of deliberate repression of the unpleasant, incidents like that of the Ganga can be used as markers of changes in natural entities and the subsequent emotions they evoke.

If eco-anxiety can be said to arise from a situation wherein the natural space or environment which was once familiar and safe now becomes dangerously unfamiliar, rivers are then capable of inducing climate anxiety because of our proximity to them. As the principle of familiarity gets heightened, any minor changes in the course of the river or its ecosystem would be easily seen. For instance, in the case of the Ganga's material deterioration, shock arose as people witnessed a completely unexpected spectacle. Historically and culturally the river had been a familiar entity until that time; however, with endless corpses outlining its banks, the Ganga became an unfamiliar entity.

In literary terms, this kind of defamiliarization with something which was once known is called estrangement. In this case, the Ganga becomes a completely alien and unfathomable river for the people who once associated it with endless religious and cultural connotations. Before moving on to the river and its potential to defamiliarize, it's necessary to look at what this effect looks like in literature.

Broadly, defamiliarization is a literary effect that is deliberately produced to create discomfort amongst audiences. Two main figures associated with this aesthetic are formalist critic Victor Shlovsky and the playwright Bertolt Brecht who called this *Verfremdungsefferkt* or the alienation effect.[13] Here, the writer is consciously trying to make the familiar into something incomprehensible and threatening. Such emotions have a resounding effect on the individual as they struggle to understand the present from the knowledge of the past. This technique is also employed by contemporary writers who are seeking to write consciously about the environment. For example, Amitav Ghosh is famous for pointing out such moments of estrangement in both his fiction and nonfiction contributions. Ghosh's purpose is to write a literature that depicts the reality of climate change without fictionalizing the apocalypse. Doing so makes the audience believe

that it is an incident that awaits humanity in the near future. This leads to developing the idea that the present remains untouched by atmospheric changes. As opposed to this, rivers embody the realities of our times in a unique way. They form major elements in Ghosh's writing, especially in his novel *The Hungry Tide*. Ghosh is one of the writers who portrays the rivers in a realistic form, acknowledging their ecological complexities. While content on the religious connotations of rivers takes up a lot of space in Ghosh's works, he specifically traces the environmental changes through rivers as they become agents of defamiliarization. The moment of witnessing the once familiar river as something indecipherable leads to a state of derangement for Ghosh.[14]

The effect of this defamiliarization of rivers like the Ganga may not be derangement, but eco-anxiety. Rivers of our times have unfortunately become producers of eco-anxiety due to pollution via many means. The waste that surrounds and goes into many major rivers of the globe remains an increasing concern of the world we inhabit. Often riverbanks that are polluted and devastated due to waste accumulation are never brought to our attention. As we saw in the case of the Ganga incident, such disturbing news is sometimes deemed unimportant or there is an assumption that the condition is temporary and things will eventually get back to normal. When we do see these changes, rivers like the Ganga, which have strong spiritual and religious associations, can incite ecological anxiety by becoming defamiliarized. This river has, for centuries, been regarded as closest to the gods, providing *moksha*, or ultimate liberation of the soul. However, in contemporary practices, it has become a dumping ground for waste and human corpses. This unfamiliarity provokes a question that confronts us about rivers across the planet: are rivers becoming inducers of eco-anxiety which will continue to haunt our consciousness and perhaps mobilize different actions? At the same time, we also have to wonder how reversible such changes are as part of the larger ecological conditions of our time.

Footnotes

[1] Ganga is the Hindi word for the River Ganges. The river's name changes to Padma in Bangladesh.

[2] The region of Ayodhya is famous in the Hindu epic Ramayana. It is considered the birthplace of Lord Rama, who is the central hero of this epic.

[3] In Hindu philosophy and religion, three gods are considered as central: Brahma, Shiva and Vishnu. Brahma is considered the god of creation, Shiva is the destroyer, and Vishnu is the necessary preserver of all beings.

[4] Amitav Ghosh, *The Hungry Tide* (Houghton Mifflin, 2005).

[5] Ghosh, *The Hungry Tide*, 6.

[6] Amita Mukhopadhyay, Geetha KB, Ipsita Debata, Charithra BV, and Manu Prakash, "COVID-19 Mortality in the Delta Wave in India: A Hospital-Based Study from Ramanagara District, Karnataka," *Cureus* 15, no. 8 (August 18, 2023): e43678, doi:10.7759/cureus.43678.

[7] Stephen Grey, Charlotte Greenfield, Devjyot Ghoshal, Alasdair Pal, and Reade Levinson, "Reuters Photographer was Killed After Being Left Behing in Retreat, Aghan General Says," *Reuters Investigates*, August 23, 2021, https://www.reuters.com/investigates/special-report/afghanistan-conflict-reuters-siddiqui/.

[8] Krishna N. Das, "Bodies of COVID-19 Victims Among Those Dumped in India's Ganges—Gov't Document," *Reuters*, May 15, 2021, https://www.reuters.com/world/india/bodies-covid-19-victims-among-those-dumped-indias-ganges-govt-document-2021-05-15/.

[9] "Pollution Threat," National Mission for Clean Ganga, Department of Water Resources, River Development, and Ganga Rejuvenation, accessed October 1, 2024, https://nmcg.nic.in/pollution.aspx; and Assa Doron and Robin Jeffrey, *Waste of a Nation* (Harvard University Press, 2018).

[10] Lillygol Sedaghat, "'Sea to Source: Ganges' Dispatch: The River Just needs to Flow—On Pollution, Population, and the Fate of the Ganga," *National Geographic* blog, June 15,2019, https://news.nationalgeographic.org/the-river-just-needs-to-flow-on-pollution-population-and-the-fate-of-the-ganga/; and Sreya Panuganti, "Come Hell or High Water," *Corporate Knights*, February 17, 2017, https://www.corporateknights.com/perspectives/guest-comment/come-hell-holy-water/.

[11] Joseph Dodds, "The Psychology of Climate Anxiety," *BJPsycho Bulletin* 45, no. 4 (August 2021): 222–226; https://doi.org/10.1192/bjb.2021.18.

[12] Climate Psychology Alliance, *The Handbook of Climate Psychology* (Climate Psychology Alliance, 2020), 22.

[13] For more information, see Victor Shlovsky, "Art as Device," in *Theory of Prose,* trans. Benjamin Sher (Dalkey Archive Press, 1990); and *Britannica,* "The Alienation Effect," February 7, 2020, https://www.britannica.com/art/alienation-effect.

[14] Ghosh, *The Hungry Tide*.

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About the Author

Currently enrolled in the PhD program in English literature at SUNY Binghamton, Saloni Shokeen comes from the capital of India, New Delhi. During the formative years of her PhD, she discovered her deep inclination toward rivers, especially their connotations in literature and philosophy. Her passion for rivers is particularly inspired by her close experiences with them. At the time of her master's degree in Delhi, she would travel to explore the source of the Ganga and the valleys that surround its origin. She actively wrote about her river experiences in various blogs including the blog for Arcadiana. These experiences left a great impression on her and enabled her interest in portrayals of rivers in literature. She is curious to look at river journeys as both travelogue and memoir. In her dissertation, Shokeen seeks to foreground the trajectory of material and symbolic transformation in the nature and representation of rivers across the globe.

PRIMARY SOURCES

OWÁMNIYOMNI: STILL WE GATHER

By Kachina Yeager, Shelley Buck, and Sage Yeager

Mni Wičoni. Water is life.

For many of us, water truly *is* synonymous with life—and not only because human life as we understand it necessitates water for survival. For me, as a Dakota person who also happens to be a poet, I think of water as a type of lineage. I can use waterways as a map that transcends borders of nationhood, of spatial and temporal constraint. In this way, water is a map of not only my life, but all those lives interwoven into the same cycle of water. No matter where or when I begin this map, it starts with the Mississippi River: Ȟaȟa Wakpa.

This river is a constant I return to again and again, as it always had been for my ancestors before me. And so a few years back, when our world and my personal life were both changing in ways dramatic and radically unexpected, I found refuge in the act of bringing myself to the water.

The falls and the lock. Image courtesy of Owámniyomni Okhódayapi.

This almost daily pilgrimage to the river brought me to the far edge of Nicollet Island, where you can see and hear Owámniyomni—also known as Saint Anthony Falls. In four different seasons and all kinds of weather, I walked from my Northeast Minneapolis apartment to the southeastern point of Nicollet Island where I would sing, talk to, touch, and just be alongside the river and the falls. After all, no matter how injured or sick, the river and the falls are relatives who deserve to know they are not alone, that they have not been left behind.

If the river and the falls are an ancestral attachment, then it is only fitting that it has morphed into a family affair for my mother, my sister, and me. We are each, in our own ways, not leaving our waterways behind.

On behalf of *Open Rivers,* I had an extended conversation with my mom and sister about their work at Owámniyomni Okhodayapi—a Minneapolis-based, Dakota-led nonprofit currently working to transform five acres of land at the site of the falls, a place that has been changed dramatically by the settler history and contemporary practices it has been subjected to. Currently, the falls are surrounded by the industrial remnants of Minneapolis' riverfront mill and lumber district, including the recently decommissioned Upper St. Anthony Falls Lock & Dam, and the ongoing bustle of the city's downtown.

At the center of the work my mom and sister do at Owámniyomni Okhodaypi is a deeper conversation about self, about ancestral inheritance, about Dakota history, connection to place and,

Oil painting, "St. Anthony Falls," done in 1857 by Danish-born landscape artist Ferdinand Reichardt. It shows the Mississippi River, looking upstream toward the gorge and St. Anthony Falls prior to alteration for locks and dams. Image courtesy of the Minnesota Historical Society.

moreover, to water. Our conversation begins aboard Amtrak's Empire Builder line with the three of us sitting at a table in the observation car somewhere between Red Wing, Minnesota and Winona, Minnesota.

[Kachina Yeager for *Open Rivers*] Would you please share a little about who you each are and about your connection to the place of Owámniyomni?

[Shelley Buck] I am Shelley Buck, president of Owámniyomni Okhódayapi and formerly a tribal leader for our community, Tinta Wita Prairie Island in Minnesota. I'm also your mother.

[Sage Yeager] I'm Sage Yeager, outreach and communications assistant at Owámniyomni Okhódayapi and also your little sister.

[KY for OR] And so how did you both come to be in connection with Owámniyomni, the place?

[SB] Well for me, I didn't actually know it was a sacred site and I hadn't ever been there before—

[SY] Me either!

[SB] But during my time as Prairie Island Tribal Council President, I was asked to serve on the Native Partnership Council at Friends of the Falls (the previous name of Owámniyomni Okhódayapi, OO), and it was there that I learned a lot more about the site's history and significance from other Dakota leaders and community members. As my last term on council was coming to a close, the former president of OO was stepping down and asked if I'd be willing to fill the position, and I happily accepted. Now, it's very much part of my goal to get this site and it's Dakota history more visibility, especially within Minneapolis where it often feels like Dakota people are routinely forgotten.

[SY] [laughing] Yeah, and I just followed my mom into this work.

[KY for OR] [laughing] Classic little sister move. Y'know actually, I think I was the first one in our immediate family to form a connection with this portion of the river and the falls since I would come and visit it every day, walking Nicollet Island. I love that it's become a full family affair for us; it feels extra special. What's the Dakota name for that island again?

[SB] I believe Wašte Wita was the name associated with Nicollet Island.

[KY for OR] Oh Wašte Wita, the Good Island! It is a good island. I love being able to see the top of the falls from the island and hearing its rapids. It's fun thinking about how many times I've sat there and sent čaŋšaša [red osher dogwood bark, a traditional medicine for prayer, etc.] and watched it float down towards the falls themselves. Speaking of, how would you describe the place of Owámniyomni to someone who had never been there?

[SB] In its current state? It's pretty cold and not representative of the spirit of the place or of Dakota values.

[SY] Yeah, in fact, it's actually a pretty good representation of the impact of industrialization and the harm it has caused Indigenous communities and cultures.

[SB] Very true. I guess despite the destruction and loss of Wita Wanagi [Spirit Island], there's still very much a spirit and a presence there. These days, I think there's also hope here. We've got an eagle nest, three muskrats, and other species returning to the area. Now, because of our work, people that live around this area seem really interested and want interpretive tours or walks of the site to learn more, so I think there's an excitement here, too.

[SY] As far as a literal description of the place goes though, I would say the lock and dam built [at Owámniyomni] by the Army Corps of

Engineers really blocks any view of the falls from the city and from the public. You can see the remnants of Spirit Island. You can see parts of the Mill City Ruins there, too.

[SB] And yet there's no real place to actually connect with the water; it's actually very inaccessible in its current state.

[KY for OR] Right, right. I think that's one of the big things that feels so detrimental about how sites like Owámniyomni have been treated—there's a deliberate disconnection from this body of water which serves the goal of making it feel less like a relative and more like background. It sort of feels like it works to obscure the history of the place, too.

Which kinda leads us into the next question pretty well: the Owámniyomni Okhódayapi website shares a bit of the history of this place, but I'd love to hear from you two about the history of this place and its significance for Dakota people.

[SY] It has always been a significant site for Dakota people specifically, but also other various Indigenous peoples throughout time, too. It's been a place of feast, of prayer, of trading; it's known as a place of power. Wita Wanaği was a place that women would come to give birth, allowing for the spray of the falls to be part of their birthing process and rites.

The view across the Upper St. Anthony Falls Lock & Dam to the river. Image courtesy of Owámniyomni Okhódayapi.

[SB] I've heard some people call it an international treaty site, too, as various Indigenous nations throughout time would come and make treaties there. And then when the colonizers came, they realized the power of the falls and tried to harness it for monetary purposes, and that's when a lot more of the lumber and flour mills popped up and when much of the falls were destroyed.

They're about a third of the size they used to be. And actually, the falls, they moved throughout time—

[SY] Yeah, and the Army Corps has this narrative around that, that if they hadn't locked the falls in place with the dam, that they would've just been destroyed but—

[SB] Right, but they wouldn't have been! They would've just kept moving like they always did, like our people knew they did before. I've also heard stories of how there are water beings—Unkethi—that protect the waters that live there. And some say that when the tunnels that the settlers were trying to build underneath the falls area collapsed, that was Unkethi doing their job. And some elders tell that Unkethi is just one creature, but others tell there are multiple; it just varies from tribe to tribe and family to family.

[KY for OR] We've been talking a bit about the falls as its own place and site, but we've also been talking about Owámniyomni Okhodayapi, the organization. Could you talk a bit about how OO came into being and what it means for this work to now be Indigenous-led?

[SB] Well it really all originated in 2016 as the Saint Anthony Falls Lock and Dam Conservancy. It started because Congress deauthorized boat navigation at the site due to invasive carp working their way up the Mississippi. So, they needed to do a disposition study and convey the land to local ownership [rather than keeping it under federal authority through the Army Corps of Engineers]. And because there was a hydropower company coming in called Crown Hydro, they wanted to put another hydro station [at the St. Anthony Falls, Owámniyomni]. The city and residents didn't want that, so that's when the organization [Saint Anthony Falls Lock and Dam Conservancy] started to fight that, and they were able to get passed through Congress in, I think 2018, through WRDA [Water Resources Development Act], that the land would be conveyed to the City of Minneapolis or its designee.

And from there, the organization went through some transitional names. They became Friends of the Lock and Dam, and then once they started doing community engagement, it really became more about the falls rather than the dam itself, so they became Friends of the Falls. And then, once they started doing more community engagement with Native communities and leaders through their Native Partnership Council (NPC), they started to realize that this place has this whole entire history involving the Dakota people at the site that they had no idea about. So that's when the focus turned to the four Dakota tribes in the state, hoping to give them ownership and making them the city's designee. The tribes ultimately didn't want legal ownership because why should they pay to restore stolen land? And that's when the then Friends of the Falls became the entity the tribes wanted to be named the City of Minneapolis' designee.

Then, when I came on, we decided we needed to change the name to be more reflective of this deep and rich history of Dakota culture here at the site. So, I reached out to a few language teachers for suggestions, surveyed the team and the board, and Owámniyomni Okhodayapi, which translates essentially to Friends of the Falls, was what we all landed on. And now our focus is working in partnership with the four Dakota tribes in Minnesota on what they want to see happen at the site, and they decided they wanted 100 percent land restoration. At one time,

Friends of the Falls' goal was to build a visitor center, but since then, the tribes decided land restoration was much more appropriate for the site and the falls and so that's the direction we're following.

[KY for OR] Period. That sounds like the right direction then! I was just going to ask about what the primary goals of the organization are at this point, and it sounds like land restoration is up there at the top?

[SB] Yes, land restoration at the site. So that means bringing flowing water back to part of the area where it once was, bringing back native plants and animals to the site, bringing Dakota culture back to the site—

[SY] Well, and I would say bringing Dakota *people* back to the site and to Minneapolis in general, too.

[SB] Oh yes! And I think bringing Dakota values back to the site is important too, y'know? Bringing Dakota people, Dakota values—such as Mni Wiconi—and Dakota culture back to this site and into Minnesotans' communal existence is the goal, too.

Which I think is a big part of this organization now being Dakota-led: it means a whole different direction for the site; it means it will be more natural, be more environmentally and economically sound; it's going to be welcoming to all relatives. It means that the process itself has a different view—our design and engineering team is now centered by Dakota knowledge keepers throughout the entire process. They're not just brought in once and spoken with to check off a box; they are present and central to the whole life of the process. There's also now a three-part consensus-based decision-making model where there's: the tribes represented by the Tribal Working Group; Owámniyomni Okhodayapi represented through the Program Advisory Group; and then the design team centered by the Dakota knowledge keepers. These three groups together help steer the design and programming shared at the site. Obviously, the programming could impact the way the site should be designed, so if we think about things like having canoes and bringing back the practice of dugout canoes, we'd need to have something like a boat launch there, so it's just important to have all these different people giving their input throughout the whole entire process so we think of things like this.

[KY for OR] Well, I know Owámniyomni Okhodayapi talks about the changes being made at the site as "seasons of transformation." What are these seasons and why is this framing important? How does it change the way people think about and engage with this place?

[SY] So [the seasons of transformation] align with the four seasons of the yearly cycle. We begin with Season One: Winter, which is a time of storytelling and gathering information. We use it as a time of community engagement and that's where the bulk of our efforts go in this season and where we do much of our research. Following this is Season Two: Spring, which is where the organization finds itself now. It's a time when things come alive again; it's the beginning of our programming at the site. It's the time when the design and engineering processes have started.

We are interrupted by an announcement over the Empire Builder's PA system. The conductor is telling us we can look out of the windows on the right-hand side of the train and see the Sugar Loaf in Winona, Minnesota.

"Let's see what they have to say about this," my mom remarks with the knowing tone of someone bracing themself for the all-too-common misrepresentation of their culture, people, and homelands.

The conductor says the rock formation was human-made, but the rest of his sentence is garbled beyond recognition and hidden by the loud rumble of the train.

One woman asks the whole of the car which window to look out of. Sage points her to the right-side windows. My mom asks me if I know the Dakota name of the Sugar Loaf (I don't). The woman then asks the three of us if the rock is human-made, to which my mom says she doesn't think so, even though that's what the conductor had announced. I look it up later and find that the bluff—which is itself an important landmark in Dakota cultural history—is called Sugar Loaf Bluff, but the formation that marks its highest point is *also* called Sugar Loaf so the two are often conflated and used interchangeably, causing occasional confusion. While the bluff is naturally occurring, the strange landmark at the top is reportedly from the quarrying of the bluff early in the town's settler history.

My mom tells this friendly stranger that Sugar Loaf has a Dakota name, a Native name, that was thrown aside by settlers. The woman smiles and says it makes sense there would be a Native name because "that rock has clearly been around here longer than English have been."

This develops into an exchange that reminds me of what makes my mom such a fantastic leader: her eagerness to learn is equally matched with her willingness to share and teach the things she learns to just about anybody. I forget that my phone is recording our conversation but when I remember all this has been captured, I know that it is going to be a recording I treasure for the rest of my life.

My mom tells the woman that the story of this bluff out our window is connected to a story about He Mni Čaŋ, Barn Bluff, in Red Wing. She says the bluffs were sisters, but the people were warring over the area and so one bluff went upriver and the other went down to keep the peace.

Mom turns to Sage and I and says, "Right?" We both tell her we think that sounds right.

She laughs and says, "Just wanted to check she wasn't accidentally ad-libbing."

Sage laughs, too, and says, "Or mixing together two different stories; you do that sometimes."

Our train car companion laughs and says, "Well, it's the privilege of the storyteller, right?" We all laugh, agreeing, as she adds, "Plus, you seem to have these two accountability buddies by your side."

The woman asks my mom if this is her peoples' area, and my mom warmly and openly gives her a brief history of the Dakota people, this area, our home. The woman listens raptly, and it doesn't escape my notice that a few other passengers lean in to listen to this impromptu history talk. I love moments like this, where my mom, in all her confidence and charisma, still turns back to ask my sister and I if that sounds correct. She asks us to add to her stories, patch up parts that need it, and it feels like what the futures of our people have been built from for millennia.

Eventually, the train settles back into the rhythmic grind of wheels along the tracks and we return to Owámniyomni Okhódayapi and their seasons of transformation.

[KY for OR] So, we left off just after your second season, Spring, which was the time where things are coming alive again and is the stage the organization and site are currently in.

[SY] Right, okay, so that's followed by Season Three: Summer, which will be focused on transforming the site, especially through environmental restoration. It's the season when everything really starts coming to full growth and flourishing.

[KY for OR] Ah, it's that beautiful summer green lushness this river valley knows so well!

[SY] Right, right. That's then followed by Season Four: Fall, which is all about the ongoing life of the falls. It's where everything is implemented. By that stage, we're seeing programming and restoration in action. We'd love to see the site be tribally owned at that point, and really we are overall focusing on the longevity of the place and the connection to it.

[KY for OR] Very cool, I like it. I also just want to circle back to the portion of the question about why this framing as seasons is important in how it can change the ways people are thinking about and engaging with Owámniyomni?

[SY] I think it's just more aligned with the way Dakota people move through life.

[SB] Yes, exactly, and it's just more representative of a Dakota-centered worldview and way of being. I think our culture and values are more present in that representation, and I think they instruct us to treat relatives like the falls and the river better, and I think we hope that encourages people to follow suit. I think also when you break these ideas and goals into parts like this, like seasons, it makes it easier for people to digest and understand—

[SY] Right, like there's a certain intentionality there that feels like it's built to last longer.

[SB] Yes, and so far, it seems to have really only drawn people in.

[KY for OR] Well that leads perfectly again into my next question: I'm wondering what some of the key successes of this work have been so far, and also what some of the greatest challenges have been?

[SB] One of the key successes has been the enormous support we've gotten from the surrounding community: residents, the City [of Minneapolis], the Park Board, the National Park Service, the Department of Natural Resources (DNR), Friends of the Mississippi River, the Mississippi Watershed Management Organization. We've also had support from the State of Minnesota, and a few foundations have donated, such as the Bush Foundation and the McKnight Foundation, the Saint Anthony Falls Heritage Board. I'm sure I'm forgetting some sources of support, but all that to say, we just have really great support and community behind us, which is absolutely a key success.

[SY] Oh, we also just signed that lease—

[SB] Oh right, we just signed the 25-year lease with the Army Corps which gives us site control and the ability to do site programming, which is all just a holdover until the land is conveyed to us permanently.

[KY for OR] Nice, well and if I'm remembering correctly there was something about the plat for the site that just happened recently?

[SY] Yes, the plat name was officially designated as Owámniyomni for our project site.

[KY for OR] Right yes, that's what I was thinking of! That's so cool. To sort of look at the other end of things here, what would you guys say are some of the greatest challenges so far and looking ahead?

[SY] The Army Corps of Engineers.

[SB] Yup, the Army Corps of Engineers. Also, the jurisdiction challenges. There's just so many different jurisdictions abutting the site, so working with those various stakeholders is a lot, especially when you consider the amount of time that our consensus-based model takes, and that's important to us.

[SY] Well and it's a process that is sort of just incompatible with the bureaucracy of the jurisdictional systems at play.

[SB] But yeah, ultimately, I would say the greatest challenge is the Army Corps. They have such particular processes they have to follow, and they also have a lot of challenges raising funds, so that's something we've had to try and help with. Not only for our work, but for theirs, too. It just makes things so much more complicated at every step.

[SY] And it ultimately makes it harder for us to fix the things that they've destroyed.

[KY for OR] What do you want people to know about this place and this work moving forward, especially non-native people and folks outside of Minnesota?

[SB] I want people to know the beauty and the power that's still there. I want them to learn about the Dakota culture and history of the site. I want people to be able to enjoy the full scope of what this place has to offer, just like our people have for so long.

[SY] I would say I'm hopeful that the work we're doing will shine greater light on the challenges that face Indigenous communities everywhere and demonstrate the hurdles and hoops we have to jump through when seeking justice of any kind, not only for ourselves, but for the land, too.

[KY for OR] How can others support the work that Owámniyomni Okhódayapi is doing?

[SB] They can go to our website, owamniyomni.org, and sign up for our newsletter, follow us on social media, and check our site and pages for interpretive walks that we schedule at the site. They can participate in the Run with Respect (the last one took place September 22nd), and just keep an eye out in all those online places for volunteer opportunities as we get further along in our seasons. There's also a really great and easy-to-use donate button on our website!

[KY for OR] Awesome! Well, pidamayayepi, thank you for doing this process with me. Is there anything that I haven't asked about that you'd like to share in closing?

[SB] I think just that I'm really honored to be able to do this kind of work and to help one of our relatives, the falls, you know?

[SY] Yes, and I would add that I'm just excited for more Dakota people to return to this site. Just like how Mom and I didn't really know much about this place before we started doing this work—which is obviously a result of colonization and boarding schools and genocide—so it's a really beautiful and powerful thing to see people: Dakota people, able to come back here and build that ancestral connection again.

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Shelley Buck (she/her) is an enrolled member of Prairie Island Indian Community (Bdewakaŋtuwaŋ Dakota) in Mni Sota Makoče and became president of Owámniyomni Okhódayapi in January 2023. Prior to this, she served for 12 years on the Prairie Island Tribal Council, including six years as president. She holds a variety of degrees, including a bachelor's of science from Indiana University, a master's of art from Concordia University, and a master's of jurisprudence in Indian Law from the University of Tulsa. Buck currently serves on the boards of the Minnesota Wild Foundation, Great River Passage Conservancy, Meet Minneapolis, and Wakaŋ Tipi Awaŋyaŋkapi in St. Paul. She also held the position of alternate regional vice president for the National Congress of American Indians.

Sage Yeager (she/her) is an enrolled member of Prairie Island Indian Community (Bdewakaŋtuwaŋ Dakota) in Mni Sota Makoče and currently works as the outreach & communications assistant for Owámniyomni Okhódayapi (OO) in Minneapolis. Prior to joining OO, Sage owned and operated her own videography business specializing in wedding films and varied contract work with local entities such as Prairie Island Indian Community, where she also previously served as the tribe's enrollment clerk.

TEACHING AND PRACTICE

DO YOU KNOW WHERE YOU ARE?

By Laura Rockhold

Over recent years I have been on a journey, one that has deepened my understanding of, and engagement with, the Indigenous names of the place I call home: Minnesota. As a writer, poet, and visual artist, much of my work explores themes of interconnectedness between the personal, ecological, universal, and spiritual; I have found naming to be one way of praising, participating, and communing with others and nature and even myself, as so much of who we are is rooted in language and place. Robin Wall Kimmerer writes in *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*, "names are the way we humans build relationship, not only with each other but with the living world."[1] In the spirit of these words, the following essay, poem, and images are a reflection on how language and place have the power to shape, change, and connect us. Since Indigenous tradition begins with the land, let us begin with the land.

Pike Island in St. Paul, Minnesota at the Minnesota River (left) and Mississippi River (right) confluence named Bdóte, "where two waters come together" in the Dakota language. Image courtesy of Laura Rockhold.

Minnesota is the historical and contemporary homeland of the Dakota and numerous other Indigenous peoples whose cultural, spiritual, and economic practices are intrinsic to this place. The name Minnesota comes from the Dakota name for this region, Mni Sota Makoce, which means "the land where the waters reflect the clouds." Beautiful, true, and yet for the majority of my life, I had no exposure to this name. While I am not of Indigenous heritage, learning of it felt joyous, like a necessary homecoming, but I also grieved the loss.

During the genocidal process of settler colonialism, Indigenous peoples were forced to forsake their languages for English, and lost their languages through displacement, destruction of canonical texts, and other forms of erasure. Until the passing of the American Indian Religious Freedom Act in 1978, forms of cultural expression from tribal nations were outlawed.[2]

In my experience, Minnesota's Indigenous culture was not taught in the public schools I attended in the 1980s and '90s, nor in my childhood home. I lived in a mostly white, middle-class suburb on a block with one small, undeveloped plot designated as sacred Indigenous land even though it lacked appropriate signage; sadly, it became the place where neighbors took their dogs to defecate. Today, support for and access to Indigenous cultural knowledge is improving and I have seen positive changes. For example, Minneapolis' largest lake, Bde Maka Ska, "lake white earth" was returned to its original name in 2018.[3]

In 2020, as a way to pass on the traditions and cultures of the Indigenous peoples of North America, U.S. Poet Laureate Joy Harjo gathered the work of 161 poets representing nearly 100 Indigenous nations into the first historically comprehensive Native poetry anthology. Harjo says,

What is shared with all tribal nations in North America is the knowledge that the earth is a living being, and a belief in the power of language to create, to transform, and to establish change. Words are living beings. Poetry in all its forms, including songs, oratory, and ceremony, both secular and sacred, is a useful tool for the community.[4]

A few years ago, I began to engage more deeply with the Dakota understandings of Mni Sota Makoce by writing poems about my experiences of sacred Dakota places (such as the poem at the end of this essay), and in the summer of 2023, I was invited to read some of these poems at an event hosted by The Witness Project (TWP).

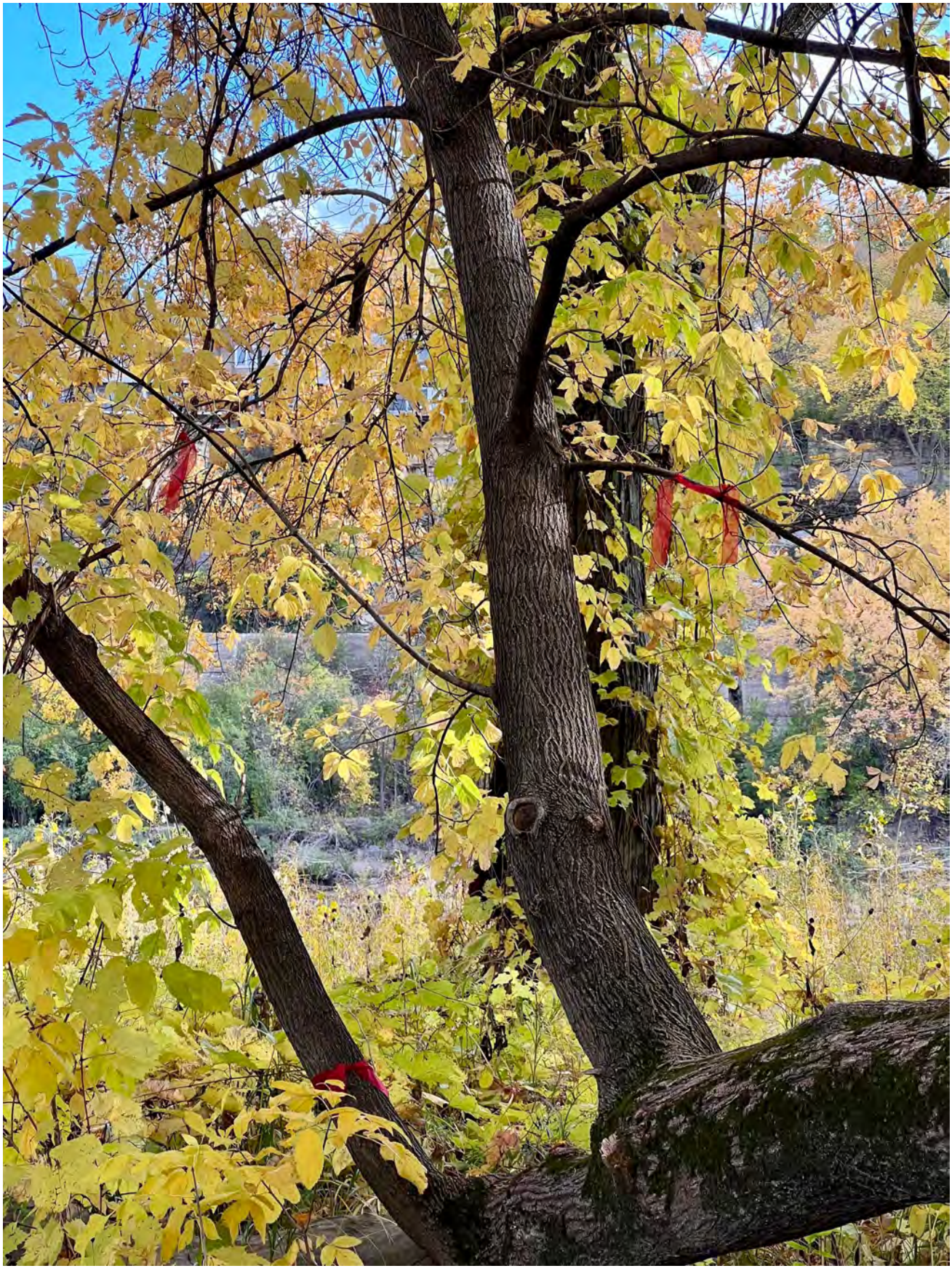
Comprised of Minnesota-based writers, TWP is focused on drawing attention to ecological relationships between humans and nature, and on promoting solutions to systemic racial and economic inequities in Minnesota through community programs, projects, and monthly workshops. The program began in 2013 with the aid of a Minnesota State Arts Board grant and the support of the University of Minnesota's Robert J. Jones Urban Research and Outreach-Engagement Center (UROC). TWP's mission is to amplify all community voices, especially traditionally silenced voices, and facilitate dynamic cross-cultural dialogue.

At TWP workshops, teaching artists lead writing exercises that introduce participants to the creative story elements of genres like fiction, memoir, and poetry. The prompts are designed to engage participants of all experience levels, providing tools to begin their own writing projects. As a participant, I have spent some time speaking with Dakota friends and doing archival research at the Minnesota Historical Society's Gale Family Library and elsewhere to learn more about the Indigenous way of knowing, Indigenous treaty rights, tribal sovereignty, and the historical and contemporary injustices and erasure that continue today.[5]

One place of particular significance to the Dakota is bdóte, "where two waters come together."

While bdóte can refer to any confluence, the Minnesota River (Mnisota Wakpá, "waters that reflect the clouds") and Mississippi River (Hahawakpa, "river of the falls" or Wakpá Tháŋka, "Great River") confluence at Pike Island in St. Paul, Minnesota is the most important bdóte to the Dakota people, a sacred place of physical and spiritual creation. This bdóte is believed to lie directly over the center of the earth and directly under the center of the universe. [6] According to oral tradition, the spirits of the seven Dakota tribes descended from Caŋku Wanaġi, "the spirit road" made up of the stars of the Milky Way, from the seven stars of Orion's belt, the center of the universe. When they arrived on Earth, the Creator shaped the first people from the clay of Maka Ina, "Mother Earth," at Bdóte, the center of the earth. The people are the Oceti Śakowiŋ, "Seven Council Fires," a society that reflects their cosmic origin.[7] Oceti Śakowiŋ tradition tells how the people came to be, teaches that all land and water are sacred, and explains that human beings hold responsibilities to one another, to the land, and to the water at places such as Bdóte. [8]

The Minnesota River and Mississippi River confluence at the tip of Pike Island in St. Paul, named Bdóte, "where two waters come together" in the Dakota language. Image courtesy of Laura Rockhold.



Prayer ties at Bdóte. Image courtesy of Laura Rockhold.

Bdóte also refers to the surrounding landscape which includes many sacred Dakota sites such as Wita Taŋka (Pike Island), the location of the Bdóte and a place where they hunted, fished, made maple syrup, and gathered. Today, the Dakota still hold ceremonies and remember their ancestors at Wita Taŋka.[9] Other sacred Dakota sites for gathering, ceremony, healing and prayer include: Taku Wakaŋ Tipi (Morgan's Mound) and Wakaŋ Tipi (Carver's Cave), Mni Owe Sni (Coldwater Springs), and Oheyawahi (Pilot Knob).[10]

Minnesota's historic Fort Snelling sits on the bluff at Bdóte and played a central role in the US-Dakota War of 1862. My early Fort Snelling education consisted of touring its grounds, buying rock candy, and watching reenactments of military drills and women churning butter. The terrible reality is that Fort Snelling was a place of genocide, a concentration camp where approximately 300 Dakota people died and 1,600 were imprisoned during the winter of 1862–63 before the survivors were forcibly removed from Minnesota in the spring.[11]

These learnings and the works of those I admire, such as U.S. Poet Laureate Ada Limón, who want to "praise our sacred and natural wonders and also speak to the complex truths of this urgent time," inform and inspire my creative practice, which usually begins with hiking ancient woods

Borer lines in tree bark at Bdóte. Image courtesy of Laura Rockhold.

American bellflower at Bdóte. Image courtesy of Laura Rockhold.

and regional trails near my home, listening and paying attention to the world's gifts and teachings.[12] When I learned of the Bdóte, I set an intention to go to the confluence at Pike Island and write about the experience. U.S. Poet Laureate Joy Harjo says, "We are creators of this place with each other. We mark our existence with our creations. It is poetry that holds the songs of becoming, of change, of dreaming, and it is poetry we turn to when we travel those places of transformation."[13]

The gift of my "Confluence" poem below came to me while visiting the Bdóte with my husband and daughter on a clear day in October 2023. Chickadees flitted among the brush. Swaths of borer-laden bark edged the trails like a script without semantic meaning but the pulse of a universal language. A narrow path through tall grasses led to the confluence at the island's point. Before walking it, I sat on a bench in silence and stillness, amidst red prayer ties undulating on tree branches, the river beyond glinting between the leaves, humbled and awed by all that surrounded me. Native scholar Greg Cajete says we understand a thing only when we understand it with all four aspects of our being: mind, body, emotion, and spirit.[14]

I hope these words encourage us to witness more, to pay attention to our surroundings and, if you are in Mni Sota Makoce, to experience Bdóte—its immanent beauty, its wounds, its offering.

CONFLUENCE

Bdóte, where two waters come together
where cottonwood and maple meet in air
light October sky on fire
where roots grip shoreline's deckled edges
holdfast on tentative pages
where unseen creatures river infinite script
scatter unbroken poems on the path
a traceable language closer to listening
do you know where you are? indigo stars
American bellflower above the understory
do you know where you are? vermillion ribbons
go softly through tall grass
where Minnesota and Mississippi Rivers merge
where centers of Earth and Universe converge
where bone black driftwood floats
where *you are—*
even if you have come with nothing

"Confluence" is currently featured in one of my two exhibits at the Minneapolis-St. Paul International Airport now through October 2025. I invite you to visit *Minnesota Waters* at Terminal 1, Gate E8 and *Minnesota Landscapes* at Terminal 1, Gate F10.

Footnotes

[1] Robin Wall Kimmerer, *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants (*Milkweed Editions, 2013).

[2] Joy Harjo, *When the Light of the World was Subdued, Our Songs Came Through: A Norton Anthology of Native Nations Poetry,* eds. Joy Harjo, LeAnne Howe, and Jennifer Elise Foerster (W. W. Norton & Company, 2020).

[3] For more on Indigenous naming in Minnesota, see Erik Martin Redix, "Rivers of Lake Superior's North Shore: Historical Methodology and Ojibwe Dialects," *Open Rivers: Rethinking Water, Place & Community,* no. 26 (Spring 2024), https://doi.org/10.24926/2471190X.11360; and Kachina Yeager, Shelley Buck, and Sage Yeager, "Owámniyomni: Still We Gather," *Open Rivers: Rethinking Water, Place & Community,* no. 27 (Fall 2024), https://openrivers.lib.umn.edu/article/owamniyomni-still-we-gather/.

[4] Harjo, *When the Light of the World,* 2.

[5] Mike Klein, *Mendota Dakota: Stories of Land and Leadership* produced in collaboration with the Mendota Mdewakanton Dakota Tribal Council, 2021; Mike Klein, *Mendota Dakota: Erasure and Recognition*, produced in collaboration with the Mendota Mdewakanton Dakota Tribal Council, 2021; Čhaŋtémaza (Neil McKay) and Monica Siems McKay, "Where We Stand: The University of Minnesota and Dakhóta Treaty Lands," *Open Rivers: Rethinking Water, Place & Community*, no. 23 (Spring 2023), https://openrivers.lib.umn.edu/article/where-we-stand-23/.

[6] Bdote Memory Map, Allies: media/art and Minnesota Humanities Center, accessed August 1, 2024, https://bdotememorymap.org/memory-map/; "Sacred Minnesota: Water Links Dakota Sacred Sites at Bdote," PBS, June 15, 2021, https://www.pbs.org/video/water-links-dakota-sacred-sites-at-bdote-38788/; Addie Wright, "Bdote in Mni Sota," Sacred Land Film Project, July 28, 2020, https://sacredland.org/bdote/.

[7] "Bdote," Historic Fort Snelling, Minnesota Historical Society, accessed August 1, 2024, https://www.mnhs.org/fortsnelling/learn/bdote; "Nation: Oceti Sakowin," Native Knowledge 360, Smithsonian National Museum of the American Indian, 2018, https://americanindian.si.edu/nk360/plains-belonging-nation/oceti-sakowin#:~:text=The%20Oceti%20Sakowin%20Oyate%20(People,Lakota%20%E2%80%94of%20the%20same%20language.

[8] "Bdote," Historic Fort Snelling.

[9] Bdote Memory Map.

[10] "Sacred Minnesota"; "Special Places: Confluences Where Great Rivers Merge," Friends of the Mississippi River, November 9, 2018, https://fmr.org/news/2018/11/09/special-places-confluences.

[11] "The US-Dakota War of 1862," Minnesota Historical Society, accessed August 1, 2024, https://www.usdakotawar.org/; "The US-Dakota War of 1862," Historic Fort Snelling, Minnesota Historical Society, accessed August 1, 2024, https://www.mnhs.org/fortsnelling/learn/us-dakota-war.

[12] Ada Limón, *You Are Here: Poetry in the Natural World,* ed, Ada Limón (Milkweed Editions in association with the Library of Congress, 2024).

[13] Harjo, *When the Light of the World,* 1.

[14] Gregory Cajete, *Look to the Mountain: An Ecology of Indigenous Education* (Kivaki Press, 1994), quoted in Robin Wall Kimmerer, *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants (*Milkweed Editions, 2013), 47.

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About the Author

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