

An aerial photograph of a city, likely Minneapolis, Minnesota, showing a wide river (the Mississippi) flowing through it. In the foreground, a large, curved parking lot is filled with cars. To the right, there are several large, multi-story brick buildings, possibly a university campus. In the background, a dense urban skyline with various skyscrapers is visible under a blue sky with some clouds. A bridge with a red and white structure spans the river in the middle ground. A barge is visible on the river in the lower left.

# ISSUE SIX : SPRING 2017

## OPEN RIVERS : RETHINKING THE MISSISSIPPI

# PROVOCATIONS

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from multiple perspectives within and beyond the academy.

ISSN 2471-190X

The cover image is aerial view of University of Minnesota East and West Bank campuses and the Mississippi River. Photographer Patrick O’Leary. Image via University of Minnesota.

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## INTRODUCTION

# INTRODUCTION TO ISSUE SIX

By Patrick Nunnally, Editor

The world of higher education is notoriously siloed. Colleges and universities are divided into departments by discipline, which often contain particular subdisciplines. Crossing these lines is difficult and sometimes perilous. But

the study of rivers and water necessarily crosses disciplines. Scientific study can tell us a lot about water, but not what the meaning of our local river is.



*Aerial view of University of Minnesota East and West Bank campuses and the Mississippi River. Photographer Patrick O'Leary. Image via University of Minnesota.*

This issue of *Open Rivers* explores higher education programs that contribute to new understandings of rivers. We include perspectives from sciences and engineering, as Barbara Heitkamp's review of the work at the St. Anthony Falls Laboratory demonstrates, and as Nicholas R. Jordan and his colleagues show in their discussion of research on Seven Mile Creek.

There is a lot more happening on campuses across the country though. This issue of *Open Rivers* is distinguished by two articles that we solicited from colleagues at other universities. Bethany Wiggin, the founding director of the Penn Program in the Environmental Humanities, offers a rich description of the kinds of programming, engagement, and exploration that come from a deep encounter with a diverse river stretch like the Lower Schuylkill River in Philadelphia. Across the continent, the Los Angeles River is the subject of Tyler Huxtable's exploration of how a river can be part of the emerging image of even such an "unnatural" city as Los Angeles. Huxtable is part of the staff at UCLA's Laboratory for Environmental Narrative Strategies (LENS).

We ask universities to undertake specific roles in our society. One of these is to push inquiries into difficult subjects, asking hard, inconvenient questions that other organizations aren't necessarily tasked with looking into. Kirsten Delegard and Kevin Ehrman-Solberg take up this challenge with their research into the historical and spatial distribution of racially restrictive covenants in Minneapolis. Their findings, that there seems to be a strong historical correlation between restrictive covenants and park lands associated with water bodies in Minneapolis, is sobering news for people committed to a more inclusive future for our water landscapes.

Sara Axtell speaks directly to the sometimes uneasy alliance between community needs and university perspectives in her reflection on bringing disconnected practices together. Universities have responsibilities to their communities, responsibilities which can be hard to understand, much less fulfill.

Speaking of communities, universities are often the location of artistic or other enriching experiences for community members as well as the campus. Phyllis Messenger's review of the theatrical production, *One River*, in Duluth describes just one aspect of a year-long community-engaged series of programs that gathered dozens of diverse perspectives on the St. Louis River.

Of course, the most visible embodiment of a college or university is its student body. Joe Underhill offers a rich, evocative reflection on a semester-long trip down the Mississippi with a group of students from Augsburg College. Kristen Anderson took a more traditional route to broadening her education: study abroad. Anderson's year in Germany nevertheless broadened her understanding considerably of how communities interact with water.

Issue 6 is broadly diverse, yet quite focused. We think all of the pieces contained here offer a distinctive, provocative, perspective that pushes our thinking forward on issues of place, community, and water. Look for more like this in the months to come. Happy reading!

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FEATURE

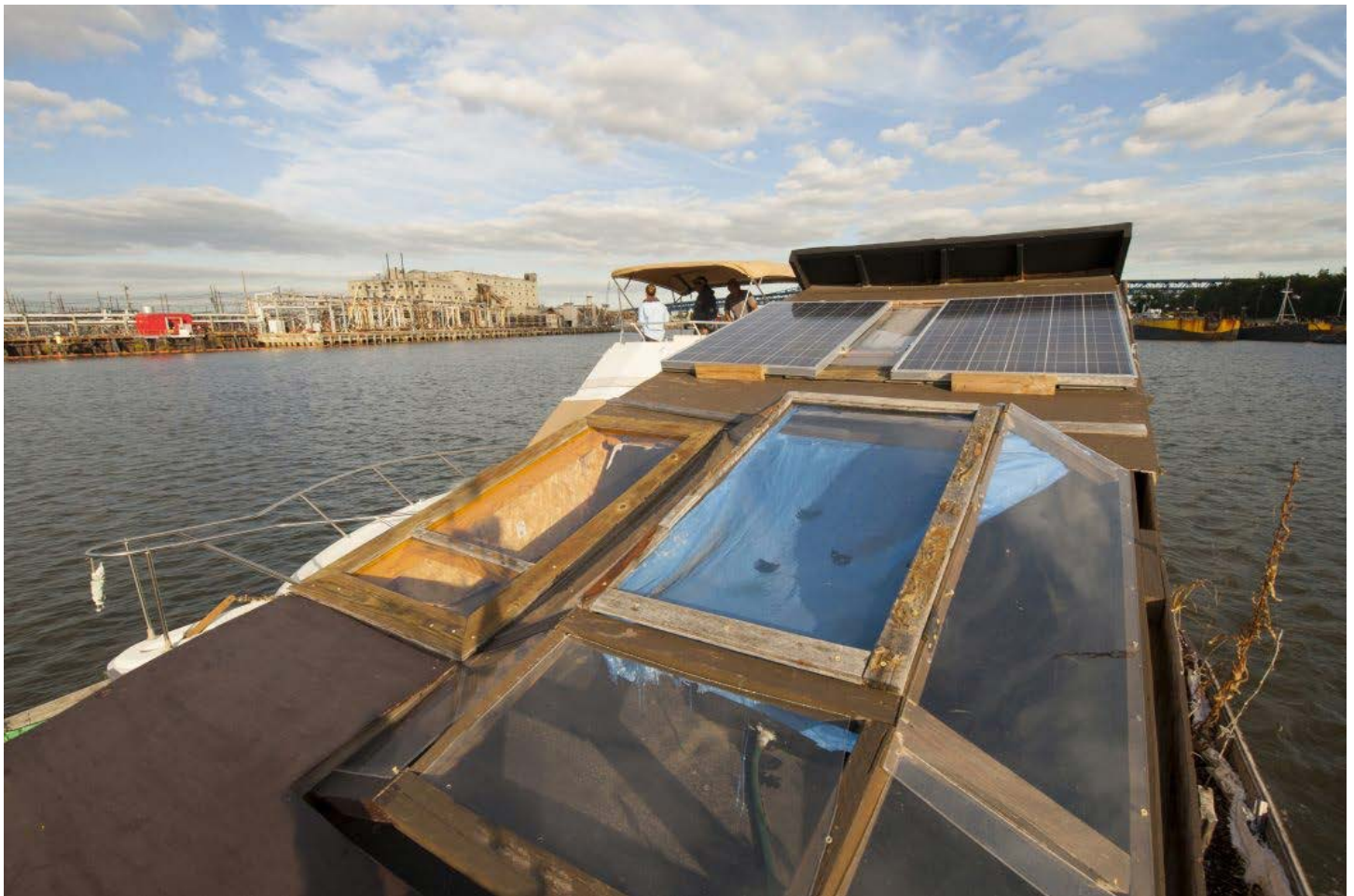
# FORGOTTEN PLACES AND RADICAL HOPE ON PHILADELPHIA'S TIDAL SCHUYLKILL RIVER

By Bethany Wiggin

How do we see an urban, industrial river? How do we hear its stories? Who gets to tell them?

I first got *on* the lower, tidal Schuylkill River on October fifth, 2015. With a boat captain, a first

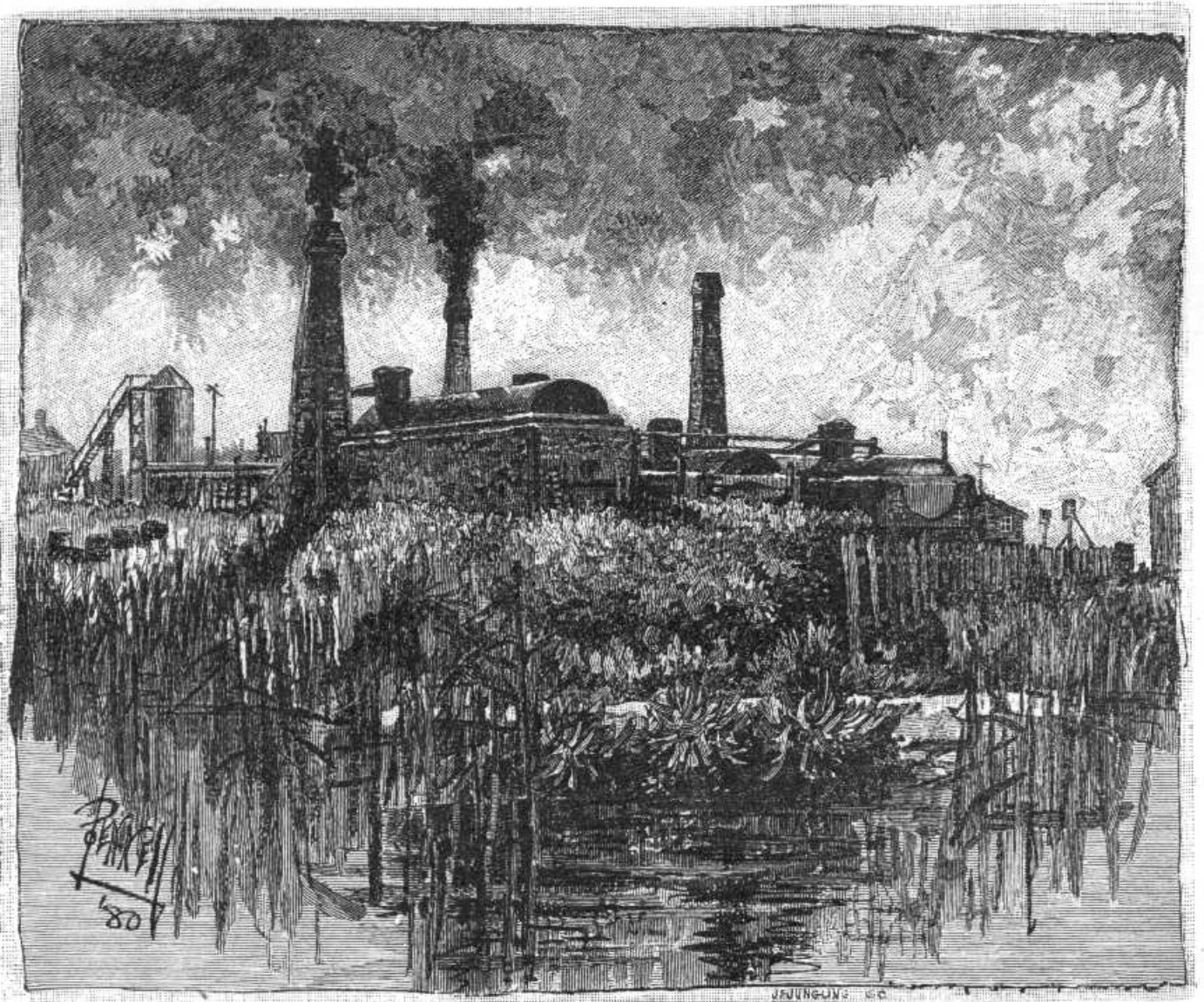
mate, and a photographer, I was helping push a floating lab for experiments in sustainability into position. Since that day, these questions about how to see and to listen for Philadelphia rivers' stories have occupied me, a historian trained



*WetLand + Refinery: View from The WetLand Project's floating lab motoring up the Schuylkill River. Image by Phil Flynn. Image courtesy of Bethany Wiggin.*

originally in European literature and in the print culture of the colonial Atlantic world. They are not questions I, or indeed I think perhaps anyone, can answer alone, but will best be answered by many voices. Here, I'll sketch some of the ways that we—a loose network of researchers whose fields span the arts and sciences in partnerships with an array of non-profit community organizations and individuals—have begun researching our city's urban rivers. We're focusing our efforts on the lower, tidal Schuylkill River.

This stretch of the river can be described by what Ruth Wilson Gilmore calls a “forgotten place.” Such places, Gilmore explains, “are not outside history. Rather, they are places that have experienced the abandonment characteristic of contemporary capitalist and neoliberal state reorganization.”[1] Outside official history, this particular forgotten place is everywhere marked by energy regimes; it is a “sacrificial landscape,” in the evocative phrase of energy historian Brian Black, a landscape sadly typical of what Stephanie LeMenager calls “petromodernity.”[2] The river



OIL-REFINERY.

*Joseph Pennel, “Oil Refinery.” Scribner’s Monthly. 22.3 (July 1881).*



is inseparable from the refinery complex in operation there since the 1860s.

Yet this section of the river also teems with personal and local histories that intersect with histories of land use and social and environmental

justice in and along the lower Schuylkill River and further afield. In researching them, in the acts of their recall and remembering, collaborators in the group we have come to call the Lower Schuylkill River Corps also aim to voice alternative futures.

## The *WetLand* Project

I direct the Penn Program in Environmental Humanities (PPEH) at the University of Pennsylvania in Philadelphia, and I first got on the river to install a collaborative, public art project built around sculptor and social practice artist Mary Mattingly's floating, habitable, sculpture *WetLand*. As we pushed *WetLand* up

the river that early October day, I was astonished by the riparian landscape. Although I had seen it hundreds of times *from above*—while whizzing on the train or in a car to the airport or even from a plane, I had never seen the river *from the water*.



*Piloting WetLand up the Schuylkill. Image by Phil Flynn.*

We were motoring slowly, guiding the top-heavy barge across the Delaware River and up the Schuylkill; it seemed it would take forever to get past the repurposed navy yard and then up miles of river whose banks house the eastern seaboard's largest refinery complex.[3] On our slow-moving trip, we also saw herons and ducks, a small fleet of fire boats and some tugs, as well as the occasional security guards on foot or driving white pick-up trucks and mildly interested in what surely must have looked unusual. We were on our way to Bartram's Garden on the western bank of the tidal Schuylkill, the oldest botanical garden in the Americas and home to a public dock where *WetLand* could tie up before and after we had been granted and paid for permissions to use a public dock further upriver and closer both to Penn's campus and to a much larger public audience.

Forced by our low speed to slow down and really look, I couldn't understand what I was seeing. At that time, I couldn't even figure out how to begin to decode what I was seeing and to understand how that strange and unfamiliar land- and waterscape had come to be made. Did we know anything, I wondered, about the water quality? And what was under its surface?

Mary Mattingly, *WetLand*'s creator, has called it a "total institution" and an "experiment in sustainability."

See the video [WetLand](#).

She built *WetLand* in the summer of 2014 with repurposed materials, many from the waste stream, as a commission for a theater festival, funded by the Knight Foundation. Docked during the festival's three weeks at the Independence Seaport Museum on the Delaware River in Philadelphia, Mattingly—and other artists, scientists, gardeners, beekeepers, boat builders, students, community activists, and water enthusiasts—worked and lived aboard the retrofitted houseboat—and were visited by some

40,000 people. I was among *WetLand*'s many visitors, and I began to talk with Mattingly about collaborating together to move *WetLand* to the Schuylkill River, closer to my university's campus and closer too to the popular Schuylkill River Trail. [4]

Prior to launching *WetLand* on the Schuylkill, I had spent hours *along* the river, walking and biking on the award-winning Schuylkill River Trail. The trail begins in Center City and travels upriver, past the dam at the historic Fairmount Waterworks, now managed as an interpretive center by the Philadelphia Water Department. Above the fall line marking the meeting of the low-lying Atlantic Coastal Plain with the Piedmont, the Schuylkill has long provided the city's primary source of drinking water.[5] It has also long been an industrial river. Parts of this history provide the basis for legislation enacting the Schuylkill Valley as a National Heritage Site. Championed by the Commonwealth of Pennsylvania's then senators, Democrat Arlen Specter and Republican Rick Santorum, the Schuylkill became a Heritage River in 2000. As the Act's Findings and Purpose outline, "there is a longstanding commitment to—(A) repairing the environmental damage to the river and its surroundings caused by the largely unregulated industrial activity; and (B) completing the Schuylkill River Trail along the 128-mile corridor of the Schuylkill Valley." [6] All this is true, subject too of Chari Towne's *A River Again: The Story of the Schuylkill River Project*. [7] But it is only true above the fall line. The official history of the Schuylkill River enacted by this legislation provides no mention of the refinery complex in place for over 150 years. This is a history of the river as if the river itself stopped short and pulled up its courses at the fall line; the tidal river has effectively been forgotten.

Below the fall line, the river flows southeasterly to the confluence with the Delaware River, at the city's southern tip. From there, it's a short 30 miles to the head of the Delaware Bay—and then

you're out onto the open Atlantic. The colonial city's founder, English Quaker William Penn, sited what he projected to be a city of brotherly love between the two rivers to ease settlement and trade and to live alongside the Lenape (or Delaware) whose villages had long flourished in these rivers' valleys.[8] Like nearly all European colonial outposts in the Americas, Philadelphia was sited to take advantage of the rivers. The area's natural abundance, especially its birds, was featured in advertisements since the earliest days of the region's European settlement and attracted ever more colonists. In the 1630s, the vast tidal marshes are estimated to have covered some 5,700 acres. As first Swedish and Dutch and then, increasingly after 1700, English and German settlers began to dike and drain low-lying lands for agricultural use, that acreage decreased at an accelerating rate. By the end of the twentieth century, a mere 200 acres remained. Since 1972, these comprise the country's first urban wildlife refuge, the John Heinz National Wildlife Refuge at Tinicum.[9] The region's rivers and their remaining wetlands remain crucial, if precarious, stopovers on the Atlantic migratory flyway and provide habitat for many native birds, mammals, and plants, including endangered species.

The consequences of this dramatic wetlands loss—including the city's increased susceptibility to storm surge—and the needs for its care and cultivation in what all climate models agree will be a hotter, wetter Philadelphia lay at the heart of our decision to install the PPEH Lab at *WetLand* on the lower Schuylkill River.[10] These dangerous mixes of flows of water and carbon-intensive energy sources have co-mingled on Philadelphia urban waters since mining for anthracite (or stone) coal began upriver in Schuylkill County in the 1820s. It was a new energy regime that itself built on existing uses of the river's water as a source of energy, including for the shipping of more energy (wood) and of agricultural products. The watery-mineral mixtures only thickened after the nation's first oil rush began in 1859 in Titusville, Pennsylvania; they are becoming still more dense as trains connect Bakken oil to the lower Schuylkill River and more pipelines come online to transport Marcellus Shale gas to the greater Philadelphia area (the refinery at nearby Marcus Hook was re-configured and is now online).[11]

## The PPEH Lab at *WetLand*

*WetLand* resembles a timber frame house set on a tilt atop a mud-brown hull. For some, the slope of the roof might evoke homeowners upside down in their mortgages; for most, it evokes rising sea levels and experiences of precarity.[12] But as in the disaster utopias whose stories Rebecca Solnit beautifully understands as widespread human responses to crisis and catastrophe, *WetLand* aims to imagine and foster alternatives to this human-natural dis-ease.[13] While *WetLand* was at the theatre festival, regional networks of exchange had sprung up to support its several

full-time residents to maintain their three-week experiment living off the grid with supplements to the food produced by the modest floating gardens and chicken coops. By the conclusion of the festival, Mattingly and I had agreed she would become an Artist in Residence with PPEH. Together we planned to move *WetLand* to the Schuylkill. There, I hoped it would become a rich environmental humanities zone, that is, a place supportive of research and learning on the productive edge of science and the humanities.

After 13 months of negotiations, first with the university and then with the city, the PPEH Lab at *WetLand* on the Schuylkill finally launched. With support from Danielle Redden, Director of

Riverfront Programming at Bartram's Garden, and from Penn's Sustainability Director, Dan Garofalo, we began what was to be the first of three pilot phases.

## First Pilot, Fall 2015

During our first six-week pilot in the fall of 2015, we moved *WetLand* between the dock at Bartram's Garden to a public dock one mile upriver, closer to campus in Center City. There we held two multi-day open houses. Next to the

popular river trail, *WetLand* hosted hundreds of guests, including city park and recreation officials happy (at long last!) to partner with us, as [this on-board interview](#) conducted by Mary Mattingly shows.[14] Other guests included artist collective



*"We the Weeds" on WetLand: artists Zya Levy (r.) and Kaitlin Pomerantz (m.) talk about native and invasive plants with a guest (l.) for the first WetLand Project Open House under the Walnut Street bridge on the Schuylkill, October 2015.*

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*We the Weeds*, who provided public workshops on invasive plant species that grow in the train tracks along the river as well as cocktails made of those same plants.

Landscape architect Kate Farquhar organized an entire day of co-learning and co-making. Participants could help Danielle Toronyi amplify the river's underwater sounds; others made seed bombs packed with native plant seeds, while artist Jacob Rivkin also made a stop-motion guide.

See the video [\*“How to Make Seed Bombs”\*](#).

PPEH graduate and undergraduate student Fellows led tours of the boat for the general public. Ph.D. candidate Carolyn Fornoff writes about how the Fellows took public engagement

onto new terrain on [\*the Floating WetLand blog\*](#). We organized lectures, films, and readings, and several Penn seminars used the boat in lieu of their regular classroom. In Professor Marcia Ferguson's theatre directing seminar, students worked with guest scholar and director, Sarah Standing, to create site-specific devised performances.

Ferguson and I talk about these experiences in this short film, which also features one particularly melodramatic performance.

See the video [\*Marcia Ferguson in conversation with Bethany Wiggin\*](#).

We also interviewed Philadelphia-based writer, Nathaniel Popkin, and theatre director Anisa George.



*Bartram's Robot, 2016, Mason Rosenthal Photographer Austin Bream.*

See the video [Anisa George in conversation with Bethany Wiggin](#).

Over the course of this six-week pilot, I remained haunted by the questions about how best to learn to see and hear this river's stories. With Danielle Redden and Mary Mattingly as named partners, I wrote a grant proposal, "Floating on Warmer Waters" which the Whiting Foundation generously funded. As the grant's award details:

Based jointly at Bartram's Garden, the oldest botanical garden in the Americas, and the

University of Pennsylvania, *Floating* will engage historians, scientists, and visual artists to create new programming for the public—including the more than 10,000 middle- and high-school students who visit the Garden each year. Events will explore ecologically friendly living by placing it in the historical perspective of Philadelphia's Quaker past; consider the role of utopian ideologies in shaping development and conservation; and invite the public to engage in experiments in sustainability on a floating science lab created by artist Mary Mattingly.[15]

## Second Pilot, Spring 2016

*WetLand* returned to the Schuylkill River in April 2016 after months in dry dock. For this second pilot, Mattingly, Redden, and I decided to keep *WetLand* at Bartram's Garden. The Garden sits

directly across the river from Philadelphia Energy Solutions' refinery complex; its location, its river access, its grounds and plant collections, as well as its library make it a unique vantage point to



*Professor Nikhil Anand taking part in Lower Schuylkill River Research seminar on the river. May 2016. Image by Bethany Wiggin.*

research the Schuylkill's past, present, and future. Under Redden's stewardship, the Garden now also has a community boathouse with a growing fleet of kayaks and wooden rowboats; the demand for public boating is increasing rapidly and cannot yet be met by the free, public sessions offered every Saturday from April to November.

During this second pilot, we offered a modest commission for the production *Between a Boat and a Green Place*, a series of dramatic readings curated by Gillian Osborne and directed by Anisa George. One reading, of excerpts from William Bartram's *Travels Through North & South Carolina, Georgia, East & West Florida, the Cherokee Country, the Extensive Territories of the Muscogulges, or Creek Confederacy, and the Country of the Chactaws*, was preceded by original text authored by Mason Rosenthal and read by Bartram's Robot.

*Listen to the audio recording of Bartram's Robot.*

## Beyond the Pilots

After the successful conclusion of the second pilot of the Lab at *WetLand*, a new phase of the *WetLand* Project began in October 2016 when the cooperative Schuylkill River Corps Research Seminar began meeting regularly. In conjunction with the academic conference and anticipated book, *Timescales: Ecological Temporalities across Disciplines*, the *WetLand* boat returned again to the river; and the river itself starred in a mobile installation, *Date/um*, curated by Patricia Kim.

First installed in Penn's Libraries, *Date/um* prompts consideration about what are the dates, the data, and the individual data points (a *datum*) needed to understand a river. It showcases work by River Research Seminar members. Subsequently, it's been installed in two

In April 2016, we also held a visioning meeting exploring the future of *WetLand* on the Schuylkill with participants from universities, city and federal agencies, arts and nature education. At that meeting, we announced the launch of the public Schuylkill River Corps. Co-convened by Redden, atmospheric chemist Peter DeCarlo (Drexel University), and me, this all-volunteer group researches the river, both from kayaks and from university classrooms.

Seminar members have begun work on a suite of digital tools that we hope will form the basis for tours, both self-guided and guided by River Corps members and partner organizations. A grant from Drexel University's ExCITE Center permits the development of a mobile app that will pull information from a public Omeka platform created and hosted by the University of Pennsylvania Libraries Division of Digital Scholarship.

other locations in Philadelphia, and three future installations in the Schuylkill River Valley are in the works.[16]

The work of getting to know the river's stories and histories is now also continued by PPEH's first micro-grant awards. In connection with another academic conference, Philadelphia artists, teachers, and researchers were invited to submit proposals for "Ecotopian Tools for *WetLand*." A jury of eight made six awards, to proposals for floating glass panels (Carolyn Hesse); an herbarium and guide to native river plants (Mandy Katz); submerged fiber art installations that measure the river's salinity and light saturation (Joanne Douglas); a "bio-pool" whose charcoal filters river water (Jacob Rivkin and Eric Blasco); floating bio-habitats for plants and

animals (Gabriel Kaprielian); and participatory maps, both “real” and conceptual, of the lower Schuylkill River (Cecily Anderson). Each designer will host a public workshop on the Schuylkill at Bartram’s, introducing and developing their tool, between April and July 2017.

The landscape of the Lower Schuylkill River might indeed be a “sacrificial landscape,” to return to Black’s phrase. It’s a description that gets at a historical trauma that seems to defy remembrance—mentioned nowhere in the legislation enacting the Schuylkill River as a National Heritage area while effectively erasing the tidal river from that history. What or who was sacrificed, and who or what sanctioned it? This landscape—so hard to see because of the privatization of the river banks and the building of interstate highways high above it—provides

the stage for a story about what Cathy Caruth has called the “unclaimed experience” of trauma.[17] This one, however, is intergenerational, born of slow-moving storms: the extractive regime’s slow and silent leakage—punctuated by the staccato of a spill, plume, explosion, or fire.[18] These are the slow processes of what Rob Nixon has called “slow violence”: long, slow processes that exceed a single human lifetime and stretch across hundreds of years.

I have not yet figured out how (or really even if) to write a history of this ecological crisis so long in the making. Instead, it seems wiser to continue learning to hear, and in some cases to elicit, the many different voices living along—and in some cases *on*—the river. ? Amplifying their voices today and locating others in the historical record can lend powerful claims to build more expansive

## SENSING RIVERS

“There’s no right way to use Wetland. You can use it whatever way you like. In fact, that’s one of the real challenges of the project. It’s meant to be a non-prescriptive utopia. I wouldn’t say it’s a negative utopia—but it certainly isn’t a positive one. It doesn’t tell you how to live sustainably. Instead, it invites you to think about how you might like to use this space.”

—Bethany Wiggins, RPEH Director

In the Anthropocene, the proposed name for an age of the human, perspectives on the Schuylkill River not only foster a sensitivity to ecological vulnerabilities in Philadelphia, but also offer new possibilities for sensing different kinds of data from and of the waterway. Mary Mattingly’s Wetland is a floating lab that invites people to experiment with what it means to be sustainable in a city and afloat on urban waters. Artists, scientists, writers, and activists have used this “wetland urban ecospa” as an experimental space for collaboration and generating new kinds of knowledge across the arts and sciences in order to engage multiple publics. The floating lab has hosted conversations about sustainable living, specifically in Philadelphia, and served as a lab for various experiments. Such perspectives on the river offer new kinds of information about our urban ecology, economy, and experiences.

The featured photographs and conversations each offer different kinds of histories, knowledges, and temporalities that have been gleaned from being on the river. Interviews with artist Mary Mattingly, scholar-activist Bethany Wiggins, and Philadelphia-based author Nathaniel Popkin, for instance, are displayed alongside the visual perspectives of photographer Philip Flynn along the LSR. These experiments offer different visions of how our waterways have been—and might continue to be—greenways of the future.



Credit: Philip Flynn



Credit: Philip Flynn

## HEARING RIVERS

Sensing and repositioning ourselves on the Schuylkill River demands alternative modes of accessing data and encourages an engagement with different heuristic senses. In historian of science Danna Haraway’s explanation of situated knowledges, she argues

for politics and epistemologies of location, positioning, and siting, where partiality and not universality is the condition of being heard to make rational knowledge claims. These are claims on people’s lives, the view from a body always a complex, contradictory, structuring and structured body, versus the view from above, from nowhere, from simplicity.

With Haraway’s formulation of knowledge production in mind, how then, might deep listening and storytelling offer transgressive, rich, and nuanced knowledges of a place?

The Eastwick Oral History Project documents the experiences and memories, both personal and collective, of different Eastwick residents through interviews and storytelling. Neighboring wedges of the mouth of the Schuylkill have been cut off to expand Philadelphia’s airport and the massive oil refinery complex, while runoff from unlicensed dumps led to an EPA Superfund designation on the neighborhood’s western edge. The residents share their life stories through the lens of place, reflect on the cultural landscape of their own Eastwick, and trace the history of the community through personal memories and family narratives.

Daniella Torony’s sound and visual installation, Poik Discharge, translates water quality and pollution data from the US Geological Survey into an embodied experience. Environmental data from the LSR are represented by an acoustic underwater system of sound waves. The resulting piece offers the listener a multi-sensory illustration of the impact of human development on our natural systems. Together, these projects demonstrate how deep listening is another mode of knowing a river.

## WITNESSING RIVERS

To know the Schuylkill River requires intimate practices of looking, or witnessing. Witnessing a river goes beyond traditional modes of observation and recording to include more capacious and embodied forms of extended looking, slow documentation, and collaboration. Moreover, transdisciplinary and participatory practices in collaborative spaces have the potential to reveal the LSR as a dynamic ecological space and energy landscape. How might witnessing, or new ways of seeing, reveal different histories and narratives about the river? From patient and extended looking emerge new ways of imagining and understanding our relationship with and to an urban river.

Peter DeCarlo’s Streaming Velocities is a series of timelapse videos that offer a new experience of witnessing a watery landscape that is relatively obscure. Set up at various points along the LSR, the cameras capture the river, refinery, and tides, as well as the human and non-human animals that call the watery urban home. The patience and boredom that are part of the experience of sitting along the river is condensed and lapsed into shorter amounts of time that a human audience can bear.



Credit: Lower Merion Historical Society



Credit: Philip Flynn

## DIGITAL RIVERS

How do we digitally archive a river, and in what ways do rivers function as archives? What does the digital ecology look like? And how might a digital archive-as-digital river produce, catalogue, and circulate data sustainably?

We ask computers to help us make connections because of their efficiency and speed, yet they can only work in these ways when humans define the rules of those connections with clarity and precision. Consistent description in the form of structured metadata is a powerful way to do that. However, each field has its own practices for describing and classifying its objects of study, identifying what is either essential or superfluous to the material for future purposes. When we try to bring together data across disciplines to allow for a greater variety of stories, our computer systems ask us to find a common language to describe those materials.

A variety of metadata fields emerge when documenting the digital and archival river’s ecology. What is the time that we associate with different kinds of objects? How does one create different dates and enter them in one field? In what ways can we define the temporalities of the river’s geological, material alongside that of 16th century riverine maps?

Although we attempt to address the challenges of digitally archiving a river, we do so by grounding these questions in a display of objects that are all from or about the river. The volume not only foregrounds the materiality and geology of digital media, it also emphasizes the age-old challenges of creating time fields for the Schuylkill River and its watershed, ultimately asking: when is the Schuylkill River?

*Date/um, Ecological Temporalities of the Lower Schuylkill River, Philadelphia.*



refuge, in the present. It is too early to know how this project will turn out. For now, it is propelled by the radical hope of Crow Chief Plenty Coups, described by psychologist and philosopher Jonathan Lear, and we conclude with it:

For what may we hope? Kant put this question in the first-person singular along with two others—What can I know? And What ought I do?—that he thought essentially marked the human condition. With two centuries of philosophical reflection, it seems that these questions are best transposed to the first-person plural. And with that same hindsight: rather than attempt an *a priori* inquiry, I would like to consider hope as it might arise at one of the limits of human

existence ... [Crow Indian Chief] Plenty Coups responded to the collapse of his civilization with *radical* hope. What makes this hope radical is that it is directed toward a future goodness that transcends the current ability to understand what it is. Radical hope anticipates a good for which those who have the hope as yet lack the appropriate concepts with which to understand it. What would it be for such hope to be justified?[19]

*All images and videos courtesy of the author unless otherwise noted.*



*From the Lower Schuylkill River Corps Cooperative Public Research Seminar.  
Image courtesy of Peter DeCarlo.*

## Footnotes

[1] Ruth Wilson Gilmore, “Forgotten Places and the Seeds of Grassroots Planning.” *Engaging Contradictions: Theory, Politics, and Methods of Activist Scholarship*, ed. Charles R. Hale (Berkeley: University of California Press, 2008), 31-61. Here p. 31.

[2] Brian Black, *Petrolia: The Landscape of America’s First Oil Boom* (Baltimore: Johns Hopkins University Press, 2000); Stephanie LeMenager, *Living Oil: Petroleum Culture in the American Century* (New York: Oxford University Press, 2014).

[3] This claim is made by the refinery’s current operators, Philadelphia Energy Solutions. Their homepage states, “PES is the tenth largest refiner in the United States,” and “PES processes approximately 335,000 barrels of crude oil per day, making it the largest oil refining complex on the eastern seaboard,” <http://pes-companies.com>. Regionally, as the University of Delaware’s Sea Grant program explains, “the Delaware River and Bay is home to the fifth largest port complex in the United States in terms of total waterborne commerce. Every year, over 70 million tons of cargo move through the tri-state port complex [...] It is the second largest oil port in the United States, handling about 85% of the East Coast’s oil imports,” <http://www.ceoe.udel.edu/oilspill/shipping.html>.

[4] The Trail now extends as far downriver as Bartram’s Garden and there are plans to connect it via more river boardwalks to the confluence.

[5] Today, the Delaware River system provides water for both the Philadelphia and New York metropolitan areas, supplying some fifteen million people, <http://www.delawariverkeeper.org/delaware-river/remember-delaware-river.asp>. The Schuylkill supplies an additional 1.5 million people, [http://www.phillywatersheds.org/doc/Schuylkill\\_SWPP\\_2006.pdf](http://www.phillywatersheds.org/doc/Schuylkill_SWPP_2006.pdf) (p.2), with drinking water treated at one of Philadelphia Water’s three intake plants.

The region’s “reclaimed” wetlands at the confluence of the Delaware and Schuylkill Rivers also lie under the Philadelphia International Airport which, just in October 2015, saw 35,536 plane movements, including the transportation of 2,721,598 passengers, a 3% dip from the previous month likely because of the severe fall storms that increasingly regularly visit extreme rain on the region, <http://www.phl.org/Business/ReportsPlans/Documents/AAR1015.pdf>. Two major arteries for car, bus, and truck traffic, interstates 95 and 76, ride atop former wetlands. Some 1,294 million vehicles exit daily from I-95’s Philadelphia exits, [http://www.interstate-guide.com/i-095\\_aadt.html#pennsylvania](http://www.interstate-guide.com/i-095_aadt.html#pennsylvania). (This figure aggregates the AADT composites for the ten Philadelphia exits on I-95, beginning with exit 10 for the Philadelphia International Airport in the south on the Chester-Philadelphia border to exit 32 for Academy road in the north on the Philadelphia-Bucks County border, [http://www.interstate-guide.com/i-095\\_aadt.html#pennsylvania](http://www.interstate-guide.com/i-095_aadt.html#pennsylvania).) I-76 runs along the Schuylkill River in Center City, carrying (as of 2012) over 180,000 vehicles every day, <http://www.dvrpc.org/reports/10072.pdf> (Fig.2, p.5). The wetlands have also been covered with miles of freight and passenger rail lines, including long stretches of rail along the rivers owned by two class 1 rail operators, CSX and NS (Norfolk Southern) as well as passenger rail owned by Amtrak and the regional SEPTA. (Class 1 rail is defined as “line haul freight railroads with 2013 operating revenue of \$467.0 million or more,” <https://www.aar.org/Documents/Railroad-Statistics.pdf>.)

## Footnotes Continued

[6] The full text of the Act is available *here*.

[7] Chari Towne, *A River Again: The Story of the Schuylkill River Project* (Bristol, PA: The Delaware Riverkeeper Network Press, 2012).

[8] Amy C. Schutt, *Peoples of the River Valleys: The Odyssey of the Delaware Indians* (Philadelphia: University of Pennsylvania Press, 2007).

[9] These numbers draw from the history published on the Refuge's website: [http://www.fws.gov/refuge/John\\_Heinz/about/history.html](http://www.fws.gov/refuge/John_Heinz/about/history.html).

[10] In November 2015, the City of Philadelphia released its climate adaptation plan entitled *Growing Stronger: Toward a Climate-Ready Philadelphia*. It emphasizes the hotter, wetter city we are already living in. See particularly, pp. 5-6. <https://alpha.phila.gov/media/20160504162056/Growing-Stronger-Toward-a-Climite-Ready-Philadelphia.pdf>.

[11] This summary of the region's energy history draws on Christopher F. Jones, *Routes of Power: Energy and Modern America* (Cambridge, Massachusetts: Harvard University Press, 2014) as well as on Brian Black, *Petrolia: The Landscape of America's First Oil Boom* (Baltimore: Johns Hopkins University Press, 2000). I am indebted throughout to the exceptional article by Fredric L. Quivik, "Abundance, Dependence, and Trauma at Philadelphia's Point Breeze Petroleum Refinery: A Mirror on the History of Pennsylvania's Oil Industry." *The Pennsylvania Museum of History and Biography*, 139.3 (October 2015): 265-292. Equally invigorating has been Beth Kephart's more experimental, lyrical river history, *Flow: The Life and Times of Philadelphia's Schuylkill River* (Philadelphia: Temple UP, 2007). See also Susan Phillipps, "Philadelphia's Energy Hub: A Renaissance for the Delaware Valley or a Pipedream?" State Impact Pennsylvania for WHY? broadcast available via <https://stateimpact.npr.org/pennsylvania/2016/04/01/phillips-energy-hub-a-renaissance-for-the-delaware-valley-or-a-pipe-dream/>.

[12] This interpretation was suggested by local NPR-affiliate reporter Peter Krimmins. Before making *WetLand*, Mattingly had previously made the *Waterpod*; it plied New York Harbor in 2009. On the pod, see Eva Diaz, "Dome Culture in the Twenty-first Century." *Grey Room* 42 (Winter 2011): 80-105. Since 2016, Mattingly has been leading another waterborne project in New York Harbor, the floating food forest, *Swale*.

[13] Rebecca Solnit, *A Paradise Built in Hell: The Extraordinary Communities That Arise in Disaster* (New York: Penguin, 2009).

[14] Blog post with Barry Bessler.

[15] Further award details are available from the Whiting Foundation.

[16] Danielle Toronyi's fascinating contribution, "Peak Discharge," was featured in [this radio story](#). In the absence of any pollutant load data for the tidal Schuylkill, Toronyi uses the sound of the combined sewer overflow pouring into the river as a suggestive and emotionally moving proxy.

## Footnotes Continued

[17] Cathy Caruth, *Unclaimed Experience: Trauma, Narrative, and History* (Baltimore: Johns Hopkins University Press, 1996).

[18] Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, Massachusetts: Harvard University Press, 2013).

[19] Jonathan Lear, *Radical Hope: Ethics in the Face of Cultural Devastation* (Cambridge, Massachusetts: Harvard University Press, 2008).

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## About the Author

Bethany Wiggin is the founding director of the Penn Program in Environmental Humanities. A cultural historian of Europe and the Atlantic world, she has worked on the history of the novel and the rise of reading as entertainment in Europe, globalism and the birth of fashion, "untranslatables," multilingualism, and ecological temporalities across disciplines. At present, she is working on a monograph, *Utopia Found, Lost, and Re-Imagined*. She is committed also to public humanities; in addition to leading the Lower Schuylkill River Research seminar, she also co-founded and co-directs the public [Data Refuge](#) project.

FEATURE

# MAKING AN ICON OUT OF THE LOS ANGELES RIVER

By Tyler Huxtable

Rivers have long been the spines of our greatest cities. Regardless of your geography prowess, you have no doubt heard of them—Thames, Seine, Potomac, Tiber, Ganges, Nile. These names

twist through our history and culture in ways that imitate their own billowing shapes. They feed our wells and our fields. They clean away our rubbish. They are the arteries of our civilization.



*Stretch of the Los Angeles River in the Sepulveda Basin Wildlife Area. Image via Flickr, U.S. Army Corps of Engineers, Los Angeles District (CC BY-ND 2.0).*

The Los Angeles (LA) River once shared in this universal story, though few now remember it. Generations of Angelenos have grown up around a waterway they likely don't recognize and almost never discuss. Being out of the spotlight, however, has had hidden benefits: the river has become a playground for the quiet speculation of environmental theorists and urban architects. Beneath the hubbub of the city, local universities and scholars are mapping the river's value as a space of recreation and experimentation, and as a pillar of regional history. Whether by providing social science data, economic and health statistics, political support, or media outreach, professors and researchers at University of Southern California (USC), University of California Los Angeles (UCLA), California State University (CSU), and other local institutions are breaking important ground on giving the river renewed meaning for Angelenos. From past to present, they have kept the river's rich story alive, and now are helping draw it back into recognizable form.

## An Image Problem

You might classify this as an image problem. The last century has seen the LA River morph from organic to inorganic, from recognizable to obscure. What was once a free-flowing, earth-en-bordered, flood-prone snake has become a dry, angular trough that occasionally stars John Travolta. We've added barriers and channels, dams and miles of concrete. We've shoveled dirt over it. We've built bridges at right angles. We have even tried to cover it with a freeway. Any casual observer might wonder what contempt led Los Angeles to torture its namesake waterway so much.

The reason for this obscurity, according to many histories of the region, is flood control. William Mulholland, a loud and controversial figure in Southern California's late nineteenth-century agriculture boom, made supplying huge amounts

And yet, this behind-the-scenes activity raises a fair concern about the prominence of the river's identity. Ask Angelenos where the LA River is, and most would be hard-pressed to tell you. Indeed, some may find it news that there is an LA River at all. Ask the knowing among them where it is or what it looks like and they will mention something vague about a drag racing scene in the movie *Grease*. For those truly in the know, the river is, at best, a quirky feature that matches the artsy east end of downtown; at worst, it's an infamous graffiti pit near the even more infamous Skid Row. Area author and scholar Jenny Price fairly describes it as "the most famous forgotten river in the United States" (Price 2008). It would be unfair, however, to blame Angelenos for their ignorance or to blame Hollywood for co-opting the river's image, seeing as the loudest mention the river receives outside of oblique film representations is in fifth grade geography lessons. It is hardly a known landmark.

of water to the burgeoning Los Angeles Basin his magnum opus. A land speculator and self-fashioned engineer of grandiose ambitions, Mulholland oversaw the construction of the Los Angeles Aqueduct, which to this day slices a path from the Owens River Valley in the Sierra Nevada to join the Los Angeles River, a distance of some 250 miles (Mulholland 1928). Among other repercussions, such as the small-scale war between the residents of the Owens River Valley and Mulholland's crews, the engineering feat came with the drawback of exacerbating the river's periodic flooding. Following the completion of the Aqueduct in 1913, increased flow caused the river to dramatically change course several times, to the severe detriment of those who lived and labored along its banks trying to make something of the warm climate and rich floodplain soils. Crippling floods in 1914, 1916, and perhaps most

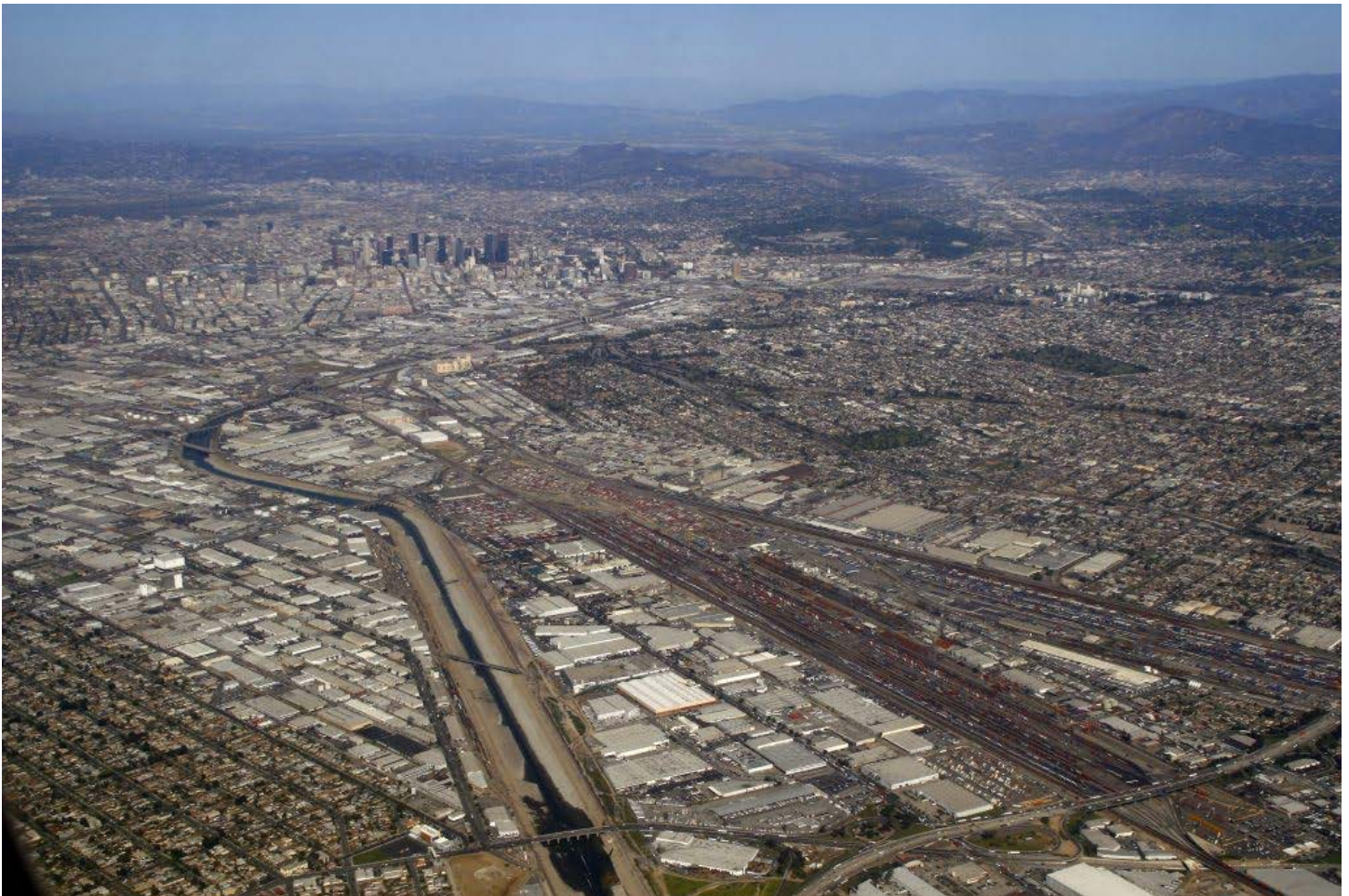
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famously 1938 sealed the river's fate: public outrage and further engineering intrepidity (this time by the U.S. Army Corps of Engineers) led to numerous dams and, ultimately, a concrete-lined channel laid through the river's entire 51-mile course. And so the forefathers of modern Los Angeles beat the river back.

In spite of this disfigurement, the LA River has persisted. It quietly collects tributaries and flood washes as it runs eastward through the San Fernando Valley's southern edge, then veers southward through the Glendale Narrows, sweeps past downtown, merges with the more inland Rio Hondo, and from there makes an artificially straight shot toward Long Beach and the Pacific. During heavy rains and melt-off, the river rises to the borders of its dams and channels, but the

concrete prevents such swells from breaching borders, much less generating headlines. Despite speculation about the potential calamity of a 100-year flood, such flooding events have so far failed to materialize, even with the sustained rainfall of early 2017 and easing of drought conditions.

But now Los Angeles is undergoing a cultural and environmental revolution that has brought the river back to the forefront of city planning conversations. In part because of the much-discussed decline of LA's palm trees, the city is in a slow scramble for a new visual icon. And beyond just aesthetics, the city is in the middle of a broader cultural reinvention, aspiring to move past its global reputation as the capital of the film industry. Even today, Los Angeles is often synonymous with mid-twentieth century Hollywood and the



*Aerial view of downtown Los Angeles (rear) and the Los Angeles River in industrial South Los Angeles (foreground). Image via Flickr, Doc Searls (CC BY-SA 2.0).*



*Upstream view of the Los Angeles River channel above Butte Street Bridge during construction.  
Image via U.S. Army Corps of Engineers Los Angeles District.*



halcyon days of the silver screen, a bygone era that no longer captures the social and technological dynamism of the contemporary city.

Cycles of erasure and reinvention are by no means a new feature of metropolitan LA. Existing literature on the image and physical changes to the city is extensive, and beyond the scope of this article. Nevertheless, works such as those by Davis (1990), Klein (1997) and Ulin (2015) speak to the phenomenon of Los Angeles being reworked as both an idea and as a physical landscape. Today's reinvention might be seen as a culmination of their ideas of continual adaptation of the urban space. The changes happening today are hardly unforeseen.

The current effort to refocus the city's image has coalesced in many forms. Perhaps the most visible and ambitious of these is the [LA2050](#) initiative, a citywide master plan led by local government and volunteer groups with broad-strokes goals of improving the quality of life, technological capability, and creative output of Los Angeles by 2050. In subtler but no less important ways, scholarship and university-led initiatives, such as UCLA's Laboratory for Environmental Narrative Strategies, are also deeply engaged in conversations about the city's shifting priorities and how to promote those priorities effectively. While we may grieve the passing of the palms as the end of a certain tropical, laid back "SoCal" identity, their demise also presents opportunity for initiatives



*Burbank Boulevard overpass, upstream from the Sepulveda Dam.  
Image courtesy of Tyler Huxtable.*

such as these to develop. Indeed, replacing the spindly palms should be seen more as a chance to remold the Los Angeles brand into something befitting the new millennium than a cause for anxiety.

So, why its namesake waterway?

In a word: simplicity. Simple symbols are easier to file away and recall at a moment's notice than complex ones. They require little investment and demand little brain space. Palms, for example, are simple, homogeneous, recognizable, perhaps even majestic in their own way. They say just enough about the climate and attitude of Los Angeles without bringing their own symbolic baggage. On the other hand, Tinseltown glamor, while undeniably powerful and graven in the city's very consciousness, isn't quite succinct enough to collectively represent a people, a climate, a way of life. Instead, a natural feature could be the most appropriate icon for a culturally transforming city. When we talk about the polluted Thames or the reddish heights of Ayers Rock, we instantly associate certain regions, peoples, and histories—the culture and the topography are woven together.

In that respect, the LA River's significance and symbolic potential are undeniable. The river already has the singular status of serving as the lifeline for one of the world's largest cities, a feat rendered even more impressive by the fact of the region's semi-arid climate. Looking toward the future, greater emphasis on the river's refreshing,

free-flowing waters would offer a much-needed about-face on current issues of public concern, such as water security, access to recreation, and environmental degradation. Reshaping the river from its current concrete-lined form into something greener and more citizen-friendly also offers powerful symbolic freedom from the city's Hollywood-focused past. This is where the promise lies for the LA River.

However, to be counted among the great metropolitan rivers of the world will not come without strict commitment and a steep price. A great deal of social and financial capital went into making the river what it is today, and a century of man-made alteration will not be easily undone.

One of the most ambitious and imminent projects is the City of Los Angeles and U.S. Army Corps of Engineers' L.A. River Revitalization Master Plan (commonly known as Alternative 20) for an 11-mile stretch of the river from Griffith Park to downtown LA. Despite emphatic praise from LA's mayor Eric Garcetti and recent approval from the LA City Council, the approximate \$1 billion price tag threatens to strain the city's coffers and has cast some doubt over the feasibility of restoring the entire length of the river. Keeping in mind what the river once was, how it functions today, and how it can replenish the ecology and community of the Los Angeles Basin is crucial for the city's green-minded entry into the twenty-first century, but success in such an ambitious project only seems likely if approached sensibly.

## Wealthy in Ideas

This is where the region's universities and scholars come into play. As keepers of history and (simultaneously) vanguards of new intellectual movements, they possess unequal influence and ability to lead the charge. Beyond their obvious institutional clout, teachers of biology, sociology,

history, engineering and urban planning have not only the expertise to forecast problems and solutions, but they have also dedicated their professional lives to messaging ideas effectively. They are expertly positioned to ensure any



*LATC, Looking southeastward (Existing and Rendering of Proposed Restoration Measures). Images via U.S. Army Corps of Engineers, Los Angeles River Ecosystem Restoration Final Integrated Feasibility Report.*

reinvention of the LA River takes all views and outcomes into account.

How to responsibly undo years of historical encumbrance and create something meaningful, utile, and emblematic will by no means be simple, but focused scholarship is laying the groundwork. Whether tapping into the psychological benefits of nature for urban dwellers or lobbying for better utilization of the river's flow, several scholars have already begun demonstrating the river's value as a space for exploration and community engagement.

One of their top concerns is how to make the river accessible for leisure. As a slew of recent studies have determined, leisure is more effective and therapeutic outside of the urban grid: outdoor recreation, hiking, and even just visual proximity to vegetation has been shown to exhibit a multitude of health benefits, as well as lowering morbidity rates from stress-related illnesses (Maas et al. 2009; Wolf and Flora 2010). A study by Swanwick et al. determined that linear green space—such as the kind specifically afforded by connected waterways and the paths that frequently line their edges—offer particularly positive health benefits for humans, in addition

## One Eye on the Past

To write the next chapter of the LA River's story requires that future development be congruous with the past. And, of course, incorporating the city's past—both the glorious bits and the less savory ones—into any new vision needs archivists familiar with the subject.

The Northridge campus of California State University hosts just such archives. CSUN's Oviatt Library hosts [Water Works](#), a series of digital collections of public and private records on the history of water in the San Fernando Valley (the original source of much of the LA River's

to establishing important ecological corridors and other environmental benefits (Swanwick, Dunnett, and Woolley 2003).

Rivers undoubtedly have an organic shape. As we now know, they also have an organic meaning. They represent the kind of disorderliness that is both antithetical to city construction and also fundamental to human health and happiness. We need wild spaces such as these to unwind, to be free. Likewise, wild spaces need some degree of freedom, too.

But giving the LA River a dramatic enough makeover to undo or obscure its grid-oriented confinements with earth and plants will be hard. After all, the urban structure of LA has been at odds with the river and the region's other natural features for the city's entire existence, and resituating the industry along the river's edges is largely off the table in current planning efforts. Though the river seemingly lost the battle with urbanization thanks to Mulholland and the determined engineers of the early twentieth century, scholars have not lost sight of its growth potential. There's still flowing water, so it's still a river at heart.

flow), including the documents of Catherine Rose Mulholland (Mr. Mulholland's granddaughter) and other officials involved in local water management. These archives track why water architects of the late nineteenth and twentieth centuries made the decisions they did as well as the evidence and goals that drove those decisions.

UCLA also maintains the [Los Angeles Aqueduct Digital Platform](#), which hosts digital records of primary sources (official letters, relevant newspaper clippings, etc.) relating to the construction and impact of the Los Angeles Aqueduct.

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Reviewing these kinds of records allows us not only to understand the concerns that spurred the builders of the past to action, but might also reveal new findings—discernable only in retrospect—that benefit future planning.

Lucky as we are to have preserved records of early modern history and the visions that led to our current incarnation of the river, we are less fortunate with primary sources of the river's pre-industrial past. Helen Hunt Jackson, somewhat of a celebrity regional historian and travel writer in the mid-nineteenth century, paints a helpful picture of the river sans concrete

in her 1883 catalogue of the region: “In those days the soft, rolling, treeless hills and valleys, between which the Los Angeles River now takes its shilly-shallying course seaward, were forest slopes and meadows, with lakes great and small. This abundance of trees, with shining waters playing among them, added to the limitless bloom of the plains and the splendor of the snow-topped mountains, must have made the whole region indeed a paradise” (Jackson 1907, 164).

Jackson's edenic floodplain is now a metropolis of more than four million people, and yet she reminds us of the grand possibilities of our own



*The first stop in Play the LA River: The confluence of Arroyo Calabasas (left) and Bell Creek (right) in Canoga Park, which form the headwaters of the Los Angeles River. The Canoga Park High School athletic field sits just above the confluence, and walking paths line the banks downstream. Image courtesy of Tyler Huxtable.*

landscape, even if it cannot look exactly like hers. Her portrait of the river, seemingly at odds with the fear of it that inspired the city's forefathers, is sublime. If we heed past triumphs and missteps,

the portrait we create will be awe-inspiring, too. This is the reason the river can be emblematic of a new Los Angeles.

## Current Capacity

Finding the paradise Jackson described in today's LA River has become a passion for some residents and scholars. Though land resources along the river's length have not always been easy to come by due to industrial densification, a little ingenuity has gone a long way in getting communities to come together along the river's banks.

One example, Project 51, is spearheaded by a group of academics, artists and strategizers—some local, some not—who intend to make the river more accessible and enjoyable in its current state. One of the collective's signature initiatives, Play the LA River, encourages recreation along the river at specified hotspots. Under the conceit of being a playable card deck, each "card" in Play the LA River suggests activities, picnic spots, biking and walking paths, parking and public transit access, playgrounds, sports fields, and photo opportunities—a great amount of suggestions that take away our excuses for staying home on a slow weekend. For those wary of the concrete-dominated or industrial segments of the river, or for those hunting for a true nature experience, the cards even have a sliding scale indicating the greenness (from "gritty" to "green") of each locale. Projects such as these promote the playful and exploratory potential of existing riparian infrastructure, even if the suggested activities are not the kind you might envision with "spending a day on the water."

Other friendly guides for taking advantage of the river's existing recreational opportunities are the

LA River Greenway Guide, published by UCLA's Luskin Center for Innovation, and a collection of maps and events by Friends of the LA River, a non-profit organization that encourages proper stewardship, planning, and re-vegetation. One of the most startling things these projects reveal is that there are indeed ways to use nearly all of the 51-mile stretch if we only apply a little imagination.

Guides such as these hone in on a key point: by boosting the river's exposure, they generate public interest, and the forgotten river creeps closer and closer toward the foreground of public concern. Politicians and their ilk have often lackluster talking points about water projects, but self-driven recreation leaves positive, organic impressions in people's minds that are hard to beat.

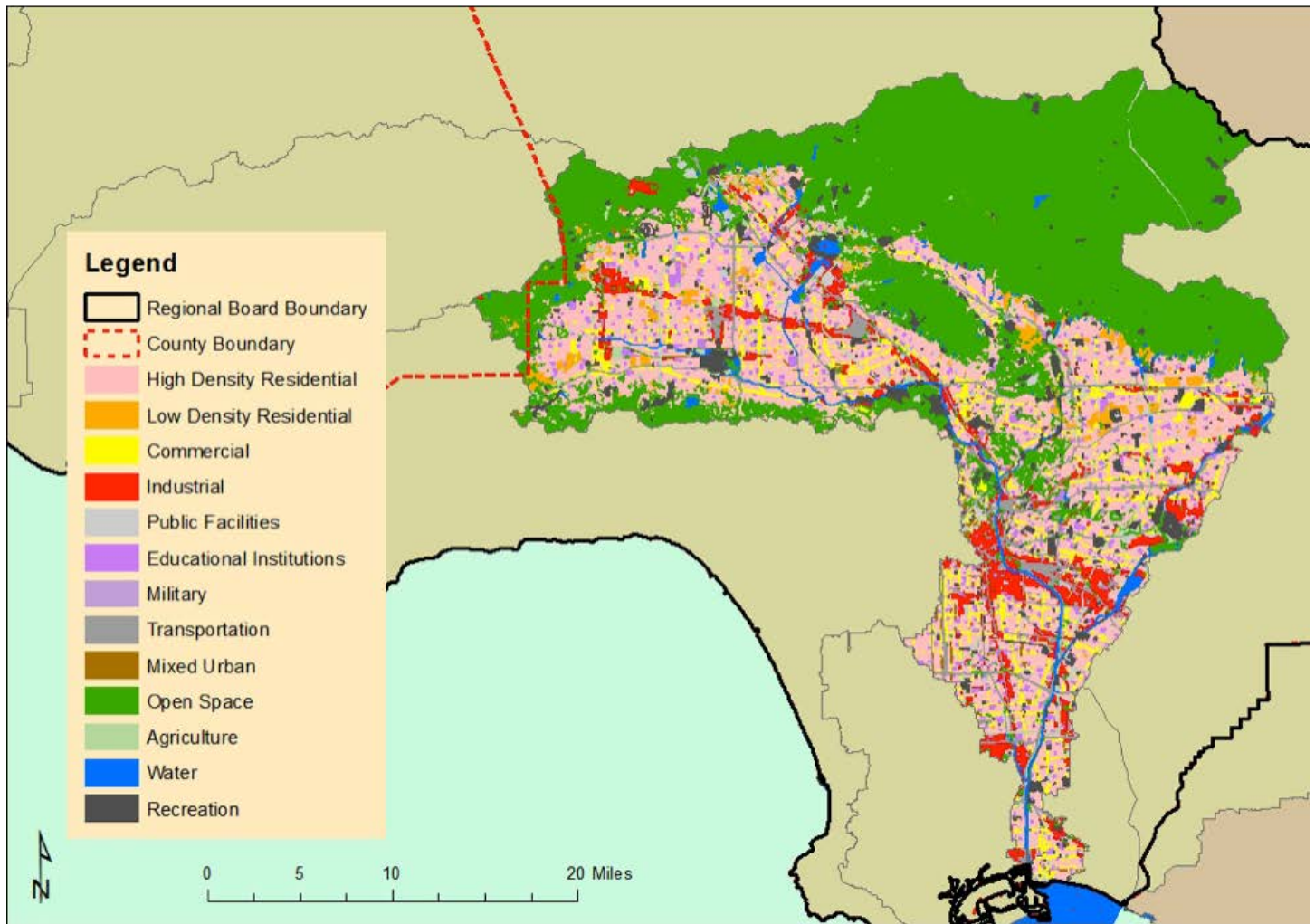
Circling back to the iconography of Los Angeles, leaving a positive imprint in the minds of community members is perhaps the surest way to reinvent the space without a rigorous physical overhaul. In some ways, a purely mental re-imagining has advantages even over recreating a natural river: it doesn't require a huge investment of capital and there's no construction downtime. We can use the river as-is as a platform for our own self-created adventures. In this way, like the palms, the river can be a low-cost symbol that represents the imagination and pioneering spirit of Angelenos.

# A Way Forward

This is not to say that we should halt investment and simply make do with the river in its current form; with an energized populace, much more than that is possible. And, thankfully, bold plans are in the works.

Local universities and scholars are laying the groundwork for the next major steps of redevelopment—analyzing impacts, modeling plans, scrutinizing land use, and mocking up great visions for the city. To say that all local universities are passionate in this quest is no hyperbole. A short-list of departments with active interests in

restoration planning are: UCLA’s Institute of the Environment and Sustainability, and its constituent organizations like the La Kretz Center for California Conservation Science; CSUN’s Center for Urban Water Resilience; Loyola Marymount’s Center for Urban Resilience; and the USC School of Architecture and its affiliated entities like the Landscape Morphologies Lab. There are of course countless other institutions and departments with hands in the effort, a testament to the incredible complexity of the issue.



*Land use in the Los Angeles River Watershed.  
Image via Los Angeles Regional Water Quality Control Board.*

Scholars have even prominently weighed in on the aforementioned U.S. Army Corps of Engineers redevelopment plan currently underway. Paul Habibi, a professor in the UCLA Anderson School of Management, authored a report for the Los Angeles Business Council offering strategies for community development around the restored river. His report, “LA’s Next Frontier”, outlines the trajectory of demographic shifts in neighborhoods along the river and presents plans for mixed-use workforce housing in those spaces that are currently dedicated to heavy industry. Aside from economic and mobility considerations, Habibi emphasizes the importance of access to parks and the health benefits of reclaiming the river for community use. As Habibi notes, the river cuts through an intricate pattern of land zoning, most being high-density residential, commercial, and industrial. Much of the infrastructure along these stretches is likely to change with the progression of the Army Corps’ project, and the report offers planners a first impression for how to cope with transportation volume and population changes. These kinds of analyses are paramount to creating something that is smart for all stakeholders.

As Habibi observes, new understanding of the benefits of urban green space is quite possibly the

most effective case for restructuring land around the river. He puts the anthropocentric benefits front and center. In a recent article, several scholars at the University of Southern California corroborate this view, even going a step further in calling LA a “living laboratory” for evaluating the efficacy of river restoration in adapting human-built spaces to climate change. They highlight that urban landscape architecture and water resource management (chiefly of the LA River) have profound implications on the city’s ability to cope with long-term water scarcity and sea-level rise. A city that is in many regards none too bio-friendly at present has the opportunity to redefine what real-world environmentalism looks like. Even with strictly human-centered, survivalist motivations, these authors build a weighty case for just such a large-scale endeavor.

Along these lines, Jenny Price asserts, “what’s happening on the banks of the L.A. River ... responds to the twenty years of critiques of environmentalism and offers us a powerful articulation for our once and future environmentalism” (Price 2008). This undertaking clearly has ramifications for more than just the river itself: it is a trial for how we effectively build on our past to orient our cities and ourselves toward a coming change.

## The Value of Clear Messaging

If the tumultuous history of Mulholland and his friends has taught us anything, it is that such a transition will not come easily, nor will it succeed without massive public support and insistence. How we interpret our own role in the river project—that is, what’s at stake for us personally and locally—is clearly not a negligible consideration. The movement to gather and harness community energy around the project is perhaps in a more nascent stage than the engineering or political aspects of it, but is nonetheless under way, and

here again universities and scholars are at the forefront.

One organization tackling the messaging aspects of environmental projects like the LA River is the Laboratory for Environmental Narrative Strategies (LENS), a constituent of the UCLA Institute of Environment and Sustainability. Founding faculty member and UCLA Professor of English Allison Carruth defines the role of LENS as “not just a public relations vehicle. It is a substantive space for engagement, for action, for



coalition building.” As part of a broader mission to invigorate a collective consciousness about environmental issues, groups like LENS can function as springboards for the kind of dialogue and action the LA River project needs.

We might think of initiatives like Play the LA River (of which Carruth also happens to be a founding contributor) as precursors to the types of innovative conversations LENS fosters. Of the impetus behind Play the LA River and, more generally, cultivating public curiosity, Carruth explains, “We realized we had to approach it in an almost preposterous way. Play crosses boundaries of age, ethnicity, class, profession, and even language as a way of bringing people together. One cannot underestimate play as a form of strategic communication.” Though Play the LA River was not a LENS project (it was designed several years prior to the conception of LENS), it laid some of the groundwork for the types of projects that groups like LENS can build on. Tapping into novel or underutilized aspects of public engagement, media, and even psychology is how organizations like LENS can promote effective, intersectional forms of discourse.

Jon Christensen, another founding faculty associate of LENS, believes messaging strategies are not only a paramount concern of the redevelopment matter, but a particular strength of the academic community. As he explains, students and professors are already operating on a range of media to

create awareness of the river project, including partnering with television news, radio shows, and even podcasts. Online publications, including *Open Rivers*, are very much part of that effort. As Christensen explains, scholars have the opportunity—and duty—to amplify discourse around the river in such a way that it is productive, fact-based, and, most of all, organic. “What we’re really interested in is the power of storytelling, and how to tell stories while being faithful to fact and rigorous research. Numbers are numbing, but stories stick.” Make no mistake: employing big data, spatial mapping, and analytical tools is an easily identifiable strength of many geography departments. However, leveraging those tools in such a way that they buttress the wealth of community stories around the river project is a newer objective that merits our attention. This objective lies at the heart of groups like LENS.

It is worth reiterating that the efforts and aims of LENS and other similar groups are still malleable. This newness is not a liability, but rather an asset, a way to cast a net for stories, ideas, and approaches that have not yet been heard or articulated effectively. As Christensen explains, while acknowledging that the movement is still in its formative stages, our focus should be on providing tools and a voice for a diverse set of storytellers about the river so that we may better understand the stakes and scope of the project. “We might think of this as one story,” he says, “but there are many different stories.”

## Conclusion

The efforts underway to reshape today’s LA River and our thinking about it are nothing short of a renaissance. From keeping history to promoting positive experiences to blending old and new landscapes, the academic community has shown that it will be a vocal force in the river’s narrative.

It bears repeating that all of these efforts work in concert: history advises our path forward and warns us of missteps; exploration and storytelling make the cause mean something to us personally; and development planning has us look toward the future together.

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And what legacy will these efforts bring?

Intuitively, river revitalization has positive yields for our community and our environment, with the added benefit of sounding spectacularly forward-thinking. Watching a natural resource be resuscitated and then flourish has obvious attraction, a sort of atavistic pleasure. Fulfilling the mantra of leaving the place better off than we found it would seem to make charity our legacy—charity to our children, or to our neighbors, or maybe even to ourselves. That is a noble goal.

On paper, however, our starry-eyed visions often seem muted. Reality too often has this effect.

In striving to make something great, we ought to be willing to accept what is possible for our river today with the resources and knowledge we currently possess. Will we be able to peel back all 51 miles of concrete? Or convert all the factories and warehouses to parks? Probably not. And it probably would not be productive to do so. Despite striving for authenticity in our vision, we may have to settle for some inauthenticity, and tread a middle path. We have to respect the purpose the river serves now, in addition to what it might do in the future. And that is also a noble goal. That kind of detente is valuable too.



*Looking east toward the De Soto Avenue Bridge, Winnetka. Image courtesy of Tyler Huxtable.*

The goal, after all, is not to replace outright, nor to re-dredge in pursuit of a historical mirage, but instead to restore luster, to blend the gray past with the green future. Los Angeles, with its weighty, gilded reputation, doesn't need a wholly new image. It is already a great city. What it needs, rather, is a new direction. The many groups and projects interested in the river offer

ways to address past wrongs and emerge stronger, cleaner, more unified. This is truly how the river can be emblematic of a new Los Angeles.

## References

Davis, Mike. 1990. *City of Quartz: Excavating the Future of Los Angeles*. New York: Verso.

Jackson, Helen Hunt. 1907. *Glimpses of California and the Missions*. Boston: Little, Brown, & Co.

Klein, Norman. 1997. *The History of Forgetting: Los Angeles and the Erasure of Memory*. New York: Verso.

Maas, J., R. A. Verheij, S. De Vries, P. Spreeuwenberg, F. G. Schellevis, and P. P. Groenewegen. 2009. "Morbidity Is Related to a Green Living Environment." *Journal of Epidemiology and Community Health* 63 (12): 967-73. <http://www.jstor.org/stable/20721102>.

Mulholland, William. 1928. "Water Supply of Los Angeles." *Journal of the American Water Works Association* 20 (4): 463-66. <http://www.jstor.org/stable/41227663>.

Price, Jenny. 2008. "Remaking American Environmentalism: On the Banks of the L.A. River." *Environmental History* 13 (3): 536-55. <http://www.jstor.org/stable/25473266>.

Scott, Allen J., and Edward W. Soja, eds. 1996. *The City: Los Angeles and Urban Theory at the End of the Twentieth Century*. Berkeley: University of California Press.

Swanwick, Carys, Nigel Dunnett, and Helen Woolley. 2003. "Nature, Role and Value of Green Space in Towns and Cities: An Overview." *Built Environment* 29 (2): 94-106. <http://www.jstor.org/stable/23288809>.

Wolf, Kathleen, and Katrina Flora. 2010. "Green Cities: Good Health: Mental Health and Function." University of Washington Urban Forestry/Urban Greening Research. Last modified September 16, 2015. [https://depts.washington.edu/hhwb/Thm\\_Mental.html](https://depts.washington.edu/hhwb/Thm_Mental.html).

Ulin, David. 2015. *Sidewalking: Coming to Terms with Los Angeles*. Oakland: University of California Press.

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## About the Author

Tyler Huxtable works with the Laboratory for Environmental Narrative Strategies (LENS), a faculty and student research incubator within the UCLA Institute of the Environment and Sustainability which explores new modes of storytelling, communications, and media in the service of environmental conservation and equity. Tyler serves as the managing editor for *LENS Magazine*, the group's signature publication, and is concerned with amplifying stories of environment, biodiversity, and community in the Greater Los Angeles Area.

FEATURE

# THE LAB ON THE RIVER: THE ST. ANTHONY FALLS LABORATORY AT THE UNIVERSITY OF MINNESOTA

By Barbara Heitkamp

When viewing the Minneapolis skyline, one generally doesn't think of hydraulic research laboratories. Indeed, from the Stone Arch Bridge, or historic Main Street, or the balconies at the Mill City Museum or Guthrie Theater, the St. Anthony Falls Laboratory (SAFL) building looks rather nondescript. Yet, this facility, associated with the College of Science and Engineering at

the University of Minnesota, is an interdisciplinary research facility whose work is focused at the intersection of fluid dynamics and major societal challenges in energy, environment, and health. SAFL can divert up to 2,200 gallons per second (300 cubic feet per second or cfs.) of Mississippi River through its collection of channels and basins for scientific research.



*The St. Anthony Falls Laboratory, taken from the Minneapolis Stone Arch Bridge.  
Photographer Patrick O'Leary. Image courtesy of SAFL.*



*The St. Anthony Falls skyline, with the St. Anthony Falls Laboratory mid-right.  
Photographer Patrick O’Leary. Image courtesy of SAFL.*

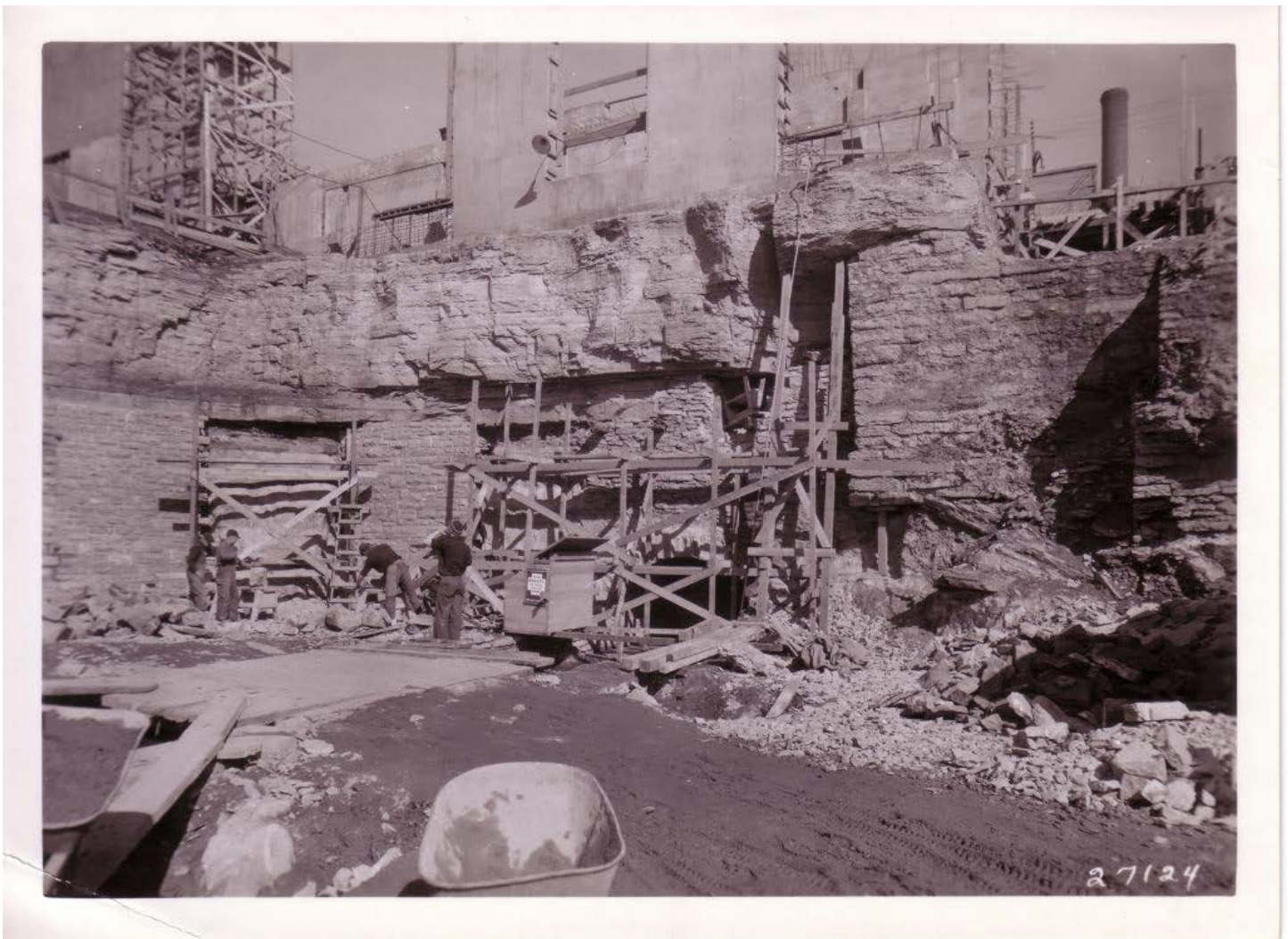


*Lorenz Straub, SAFL’s architect and first director, in his office at the  
St. Anthony Falls Laboratory. Image courtesy of SAFL.*

# Laboratory on a River : Idea to Reality

The thought of placing a hydraulic research laboratory at the St. Anthony Falls started as early as 1908. Recognizing the potential value of the natural 50 ft. drop of the St. Anthony Falls, University of Minnesota civil engineering professor F.H. Bass sent a letter to the dean indicating that the site, then the abandoned East

Side Pumping Station, could serve the University as “an unexcelled hydraulic laboratory.” Aside from some follow-up from that initial letter, that is where the story ended until the 1930s. Then, a new driver entered the scene in the form of civil engineer Lorenz G. Straub.



*Construction of the laboratory included excavation into the native Plateville Limestone on site. Image courtesy of SAFL.*



*SAFL designer and director Lorenz Straub interacting with a physical model of the proposed laboratory. Image courtesy of SAFL.*



Dr. Lorenz Straub came to the University of Minnesota in 1930 as an associate professor in the Department of Mathematics and Mechanics. He had received his PhD at the University of Illinois in 1927 and spent the last two years in Europe as a Freeman Traveling Fellow, studying the concept of using laboratory modeling to engineer solutions to river hydraulics problems. His eagerness to embrace experimental research in a laboratory setting reflected a growing national mindset of the time. In 1927, the Mississippi River flooded catastrophically, highlighting the need for refined river control methods. In 1929,

the English translation of the German edition of *Hydraulic Laboratory Practice* was released, in which the editor wrote: “Strange to say, in view of the size of our rivers and the importance of the problems they represent in navigation and flood control, there is not yet in America even one laboratory equipped for the study of river problems; and still more strange, the military engineers to whom American river and harbor problems have been given to keep them employed in times of peace, have not yet awakened to the utility of or understanding of research of this kind” (Freeman 1929, 17–18; St. Anthony Falls Laboratory 2014).



*SAFL's Main Channel Flume, which extends the entire length of one floor and can run up to 300 cfs. See sediment transport in this flume in the video included below. Image courtesy of SAFL.*

Straub was eager to revive the idea of a hydraulic research laboratory at St. Anthony Falls, but it wasn't until several years later that a viable funding source came in to play. In May 1935, President Roosevelt signed an Executive Order creating the Works Progress Administration (WPA). The program's goal was to implement projects that would employ the maximum number of workers in the shortest time possible. Straub moved quickly, helping orchestrate the legal proceedings between the City of Minneapolis, the University and the Northern States Power (NSP) Company to secure the land and water rights at the site mentioned by Professor Bass 27 years earlier, as well as submitting building drawings for the proposed laboratory. In February 1936, Straub received a letter from the WPA stating that construction could proceed (St. Anthony Falls Laboratory 2014).

It would be two years before laboratory construction was completed, especially given the significant challenges of the construction site itself. The laboratory was carved from the bluff formation at Hennepin Island, with approximately 30,000 cubic yards of bedrock and large boulders excavated on site. Such a large excavation was

necessary so the operating floors of the laboratory would be below the level of the river above the falls, so when diverted, the river water would flow through the building without the need of pumps (St. Anthony Falls Laboratory 2014).

The official dedication of the St. Anthony Falls Laboratory occurred on November 17, 1938. The new building showcased an impressive array of flumes, channels, and basins ready for use in experiments and hydraulic research. Straub worked with the U.S. Engineers Office to bring a model study to SAFL whose purpose was to test and determine what effect proposed upper and lower dams and locks at St. Anthony Falls would have on navigation conditions in the Mississippi River. The Mississippi River model, a 1:50 physical model of the Mississippi River from the Hennepin Avenue Bridge to just above the Washington Avenue Bridge, was likely one of the most famous models built at the laboratory. It stayed in place until the mid-1950s (St. Anthony Falls Laboratory 2014).

*See video of [Transport of sediment by flowing water from SAFL's Main Channel Flume](#).*

## SAFL's Evolution over Seven Decades

While the new laboratory was an educational facility associated with the University, Straub's vision was that SAFL's legacy would be shaped by its commitment to not only education and basic research, but also applied research, that is, service to the profession. Thus, the laboratory hosted not only students and classes, but welcomed cooperation and partnerships with government and industry. Several federal agencies were drawn to the new laboratory in its first decades, with some agency scientists setting up residence in the laboratory itself, including the Soil Conservation Service (now the Agricultural Research Service), the St. Paul District of the Army Corps of

Engineers, and the U.S. Geological Survey. Other partners included the Navy Department, the Minnesota State Department of Highways, Northern States Power Company, and others. In SAFL's first five decades, the majority of SAFL's research income would be from applied research projects. Much of that income would come from the Navy (particularly in the 1950s), the private sector, and other government agencies.

Many of the early research projects at SAFL included physical modeling of hydraulic structures, with Straub attracting local, national, and international projects. He built and tested physical

models of the Mangla Dam on the Jhelum River in Pakistan and the Guri Dam in Venezuela. He tested fish ladder and coffer dam designs for the Columbia River system in the Pacific Northwest. Straub became recognized internationally for his ability to diagnose and recommend solutions to hydraulic engineering problems, with one

national magazine dubbing him the “River Doctor.” SAFL researchers also conducted basic and applied research in numerous areas of fluid mechanics, including air-water mixture flow, non-Newtonian fluid flow, sediment transport, and boundary layers.

## Selection of Historic SAFL Projects

SAFL has hosted over 500 major research projects in its nearly 80 years. Read below to learn more about selected projects.

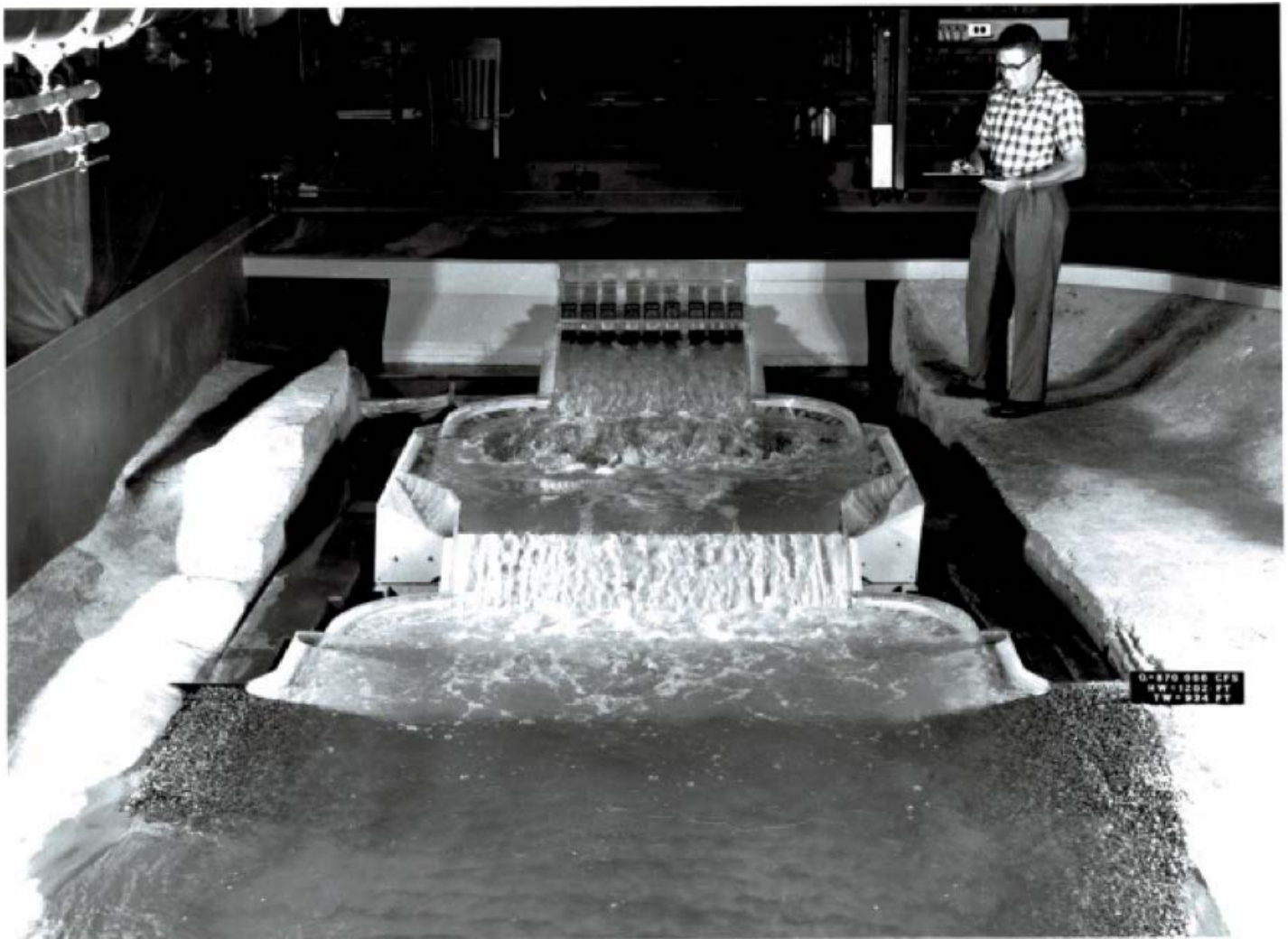


*SAFL researchers take measurements of the Priest Rapids physical model. The dam was constructed on the Columbia River in 1961. Image courtesy of SAFL.*

## Mangla Dam, West Pakistan

Mangla Dam in West Pakistan on the Jhelum River was designed to provide power and irrigation to the region. This was one of the more extensive and largest hydraulic studies performed at the St. Anthony Falls Laboratory. Initially the spillway was designed to handle 350,000 cfs., but after laboratory and field studies, the final design accommodated one million cfs. Many SAFL

personnel contributed to the decade-long project, which began in 1958, and various models and versions of models were tested.



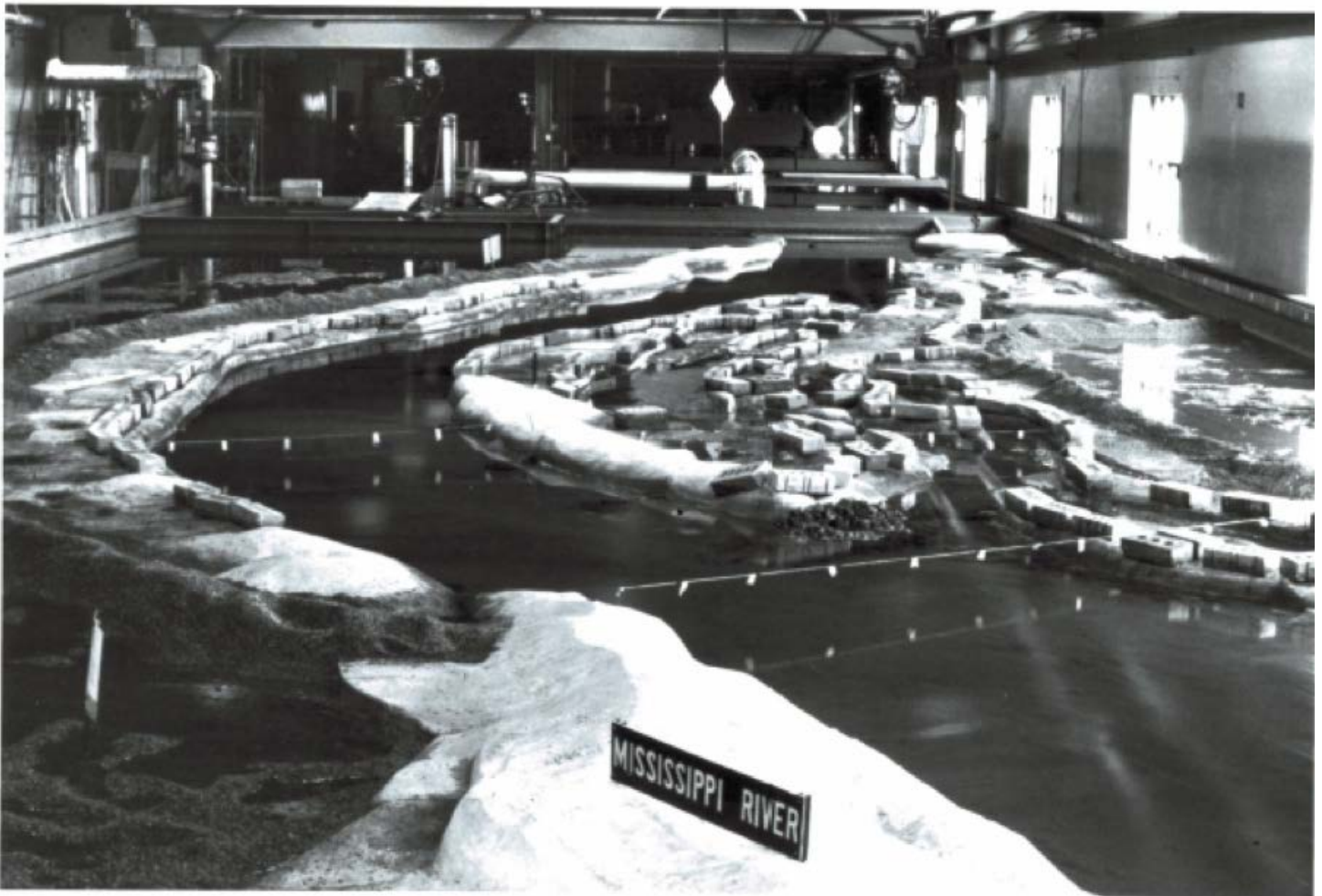
*This model of the Mangla Dam shows the basin scheme where the upper basin had been enlarged from its original design to prevent erosion during high flow conditions.*

*Image courtesy of SAFL.*

## Chippewa-Mississippi River Confluence Model

The Chippewa-Mississippi River Confluence physical model was one of many that utilized the laboratory's large model basin floor. The project, known as the Great River Environmental Action Team, was established to develop ways to reduce erosion and sedimentation in the Upper Mississippi River system. The team was particularly interested in developing an optimum way to maintain a 9 ft. navigable channel without causing harm to the environment. SAFL researchers built a scale model and tested 8 different conditions of the Chippewa and Mississippi Rivers confluence in Phase I and 14 conditions in Phase II. From the model testing, SAFL engineers were

able to caution the U.S. Army Corps of Engineers that a dam being built to capture sediment in the Chippewa River might create scouring and deposition shortly after construction. Instead, they recommended a more effective dredging schedule and wing dam designs that resulted in the most desirable channel depth with no bank scouring.



*SAFL's Chippewa-Mississippi River Confluence physical model. Image courtesy of SAFL.*

## Warm Water Discharge Study

A physical model study of warm water discharge from NSP's Allen S. King plant near Stillwater, Minnesota, was carried out to determine its effect on water temperatures in Lake St. Croix. During plant operations, water withdrawn from near the bottom of Lake St. Croix was used as a coolant, then discharged through a channel near the lake's surface. The study was conducted to determine the shape of the cooling water effluent plume. It took into consideration the momentum of the effluent flow (up to 500 cfs.), its buoyancy relative to the ambient receiving water in the

lake, and the crossflow of the river. The extent of lake surface area affected by the warm water discharge was determined by computation of the heat transfer from the water into the atmosphere. Conducted in 1964, this was one of the first studies of its kind in the world, with the methodology newly developed at SAFL. Researchers compared the predicted lake surface temperatures with field measurements made after the power plant was built, and found surface areas affected by cooling water and depth of penetration of warm water below the lake's surface were well predicted.



*Physical model of the Lake St. Croix. Image courtesy of SAFL.*

# SAFL after Straub

Straub served as SAFL's director until his death in 1963. One of his former graduate students, Dr. Edward Silberman, professor of civil engineering, was appointed director. Under his leadership and that of others over the coming decades, SAFL's ability to creatively meet the ever-shifting needs of society emerged as one of its greatest strengths. Beginning in the 1960s, SAFL evolved beyond a focus on hard structures imposed on the natural environment to a broader view that emphasizes restoration and sustainable management, working with natural tendencies rather than seeking to ignore or control them. These developments led to much closer ties between

engineering and the natural sciences, especially the Earth sciences and ecology.

From 1963 to 1977, under the directorship of Edward Silberman and Alvin Anderson, SAFL focused on intensifying the already robust naval hydrodynamics research and expanding its basic research in such areas as stratified flows, turbulence, and hydrology. Support from the National Science Foundation (NSF) made expansion into these new research areas possible.

Under Director Roger Arndt (1977-93), the laboratory emphasized the integration of education



*The SAFL Wind Tunnel is largely used for wind energy research, including optimization of power from different wind farm configurations. Image courtesy of SAFL.*

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and basic and applied research, including research in hydraulic and river engineering. Several new faculty were appointed, bringing new research efforts in such areas as water resources and energy, environmental and water quality research, and small hydropower development. In 1988, a large-scale wind tunnel, designed to study the boundary layer effects on natural and/or urban environments, was constructed atop SAFL's original structure. Research funding came from such diverse agencies as the U.S. Navy, NSF, the Department of Energy, and the Legislative Commission on Minnesota Resources.

From 1993 to 2005, Directors Gary Parker and Efi Foufoula-Georgiou sought to broaden the participation of other University of Minnesota researchers, adding new faculty with expertise in geology, eco-biological fluid dynamics, and atmospheric boundary layer turbulence. New research

areas and faculty expertise catalyzed the transformation of SAFL from the traditional hydraulic engineering research facility to a hub of progressive interdisciplinary fluid mechanics research that can adapt to the pressing environmental needs of the time. These efforts culminated in 2002 with the creation of the National Center for Earth-surface Dynamics (NCED), an NSF Science and Technology Center devoted to quantitative, transdisciplinary study of the surface environment. During its 10-year tenure, NCED comprised engineers, ecologists, Earth scientists, and social scientists.



*The Eolos Wind Energy Field Station consists of a fully instrumented 2.5 MW Clipper Liberty wind turbine and 400-ft meteorological tower located in Rosemount, Minnesota.*

*Image courtesy of SAFL.*



From 2006 through 2015, under the leadership of Director Fotis Sotiropoulos, SAFL continued its expansion into new interdisciplinary research areas emphasizing renewable energy resources (wind, marine hydrokinetic energy, and biofuels), environmental restoration, and biological and cardiovascular fluid mechanics. The SAFL-led University of Minnesota wind energy research consortium, funded by a grant from the U.S. Department of Energy, led to the development of a major new research facility in Rosemount, MN where the 2.5MW EOLOS wind energy research field station was installed. The SAFL Outdoor StreamLab (OSL), SAFL's most publicly visible facility, was built in 2008 on an abandoned flood bypass channel adjacent to the laboratory. Designed as an experimental stream channel

and floodplain system, the OSL represents a step between the laboratory and the field where major components (flow and sediment) can be controlled while allowing natural sunlight to foster a more natural ecological system.

In September 2010, SAFL secured an American Reinvestment Grant from NSF and the University of Minnesota for renovation. The renovation—the first significant renovation since construction in 1938—addressed infrastructure deficiencies and proposed upgrades to key research facilities in the laboratory. The renovation, which took some three years to complete, included basic infrastructure upgrades such as a stair tower and elevator, as well as research facility upgrades like outfitting several SAFL spaces with data



*The Outdoor StreamLab (OSL) facility bridges the gap between laboratory and field by allowing control of several parameters (flow, sediment, data collection) while also allowing natural sunlight to drive natural ecological processes. Image courtesy of SAFL.*



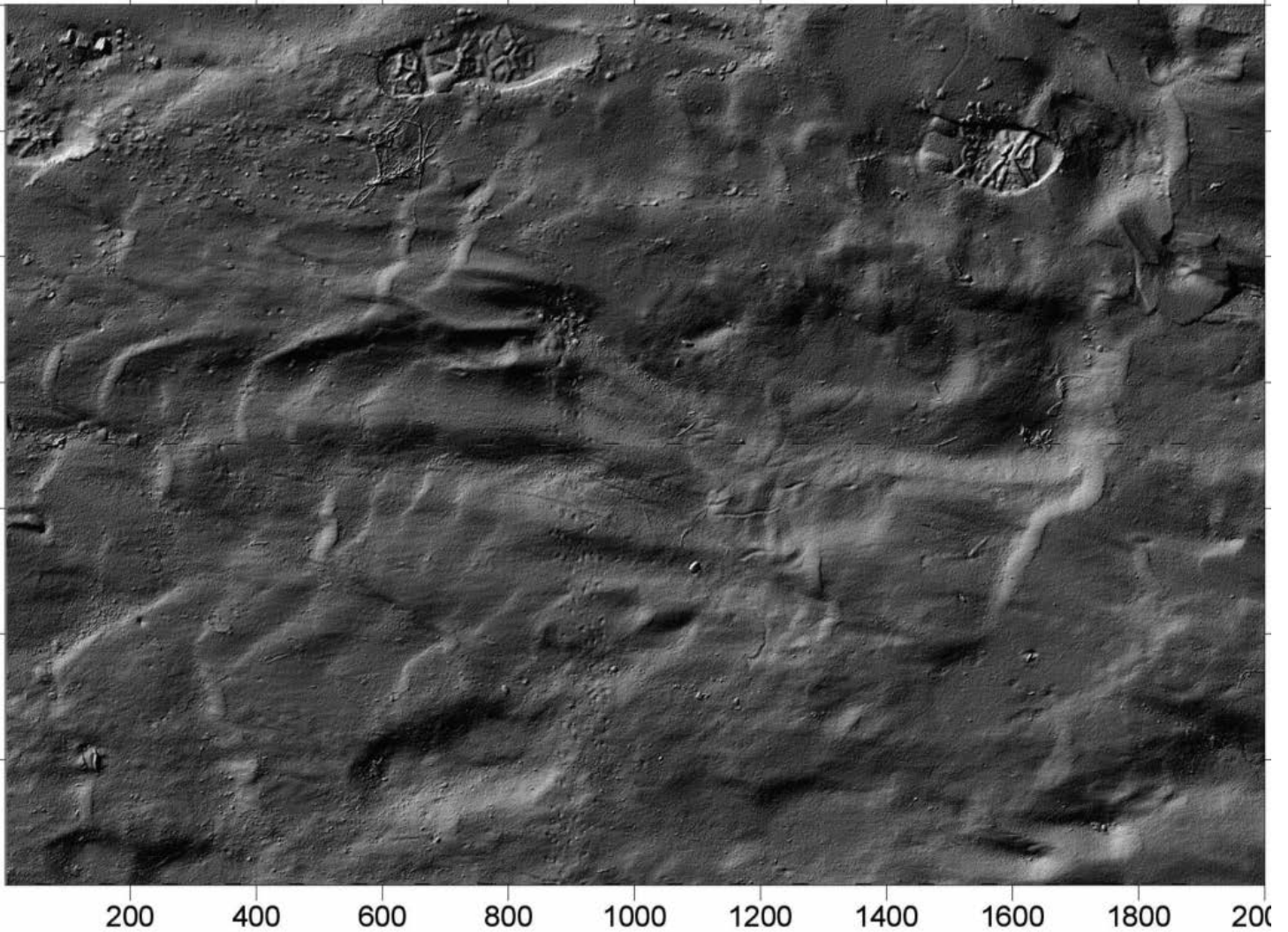
*One of SAFL's data collection carriage systems. Image courtesy of SAFL.*

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collection carriage systems with 3D surface and sub-aerial scanners capable of taking sub-millimeter resolution measurements.

Since late 2015 Professor Chris Paola, who has been affiliated with SAFL since the early 1980s, has served as interim director. SAFL is currently

conducting a search for a new director, who no doubt will continue the tradition of expanding the laboratory's research agenda to address today's societal concerns.



High speed scan - 2,800,000 data points collected in 20 seconds.

*This topographic data, not a photograph, was collected in SAFL's main channel flume using the automated data carriage system. Image courtesy of SAFL.*

# SAFL Today

Today, SAFL continues to follow its original mission to advance fundamental knowledge in fluid mechanics, benefitting society by implementing such knowledge to develop robust and sustainable engineering solutions to today's environmental problems, and training the next generation of scientists and engineers. The laboratory's vision and mission are well aligned with research trends at the national and state level. Federal and state funding agencies increasingly invest in multi-university, multi-disciplinary research efforts aimed at tackling grand-challenge problems that have the potential to have a direct impact on societal well being (St. Anthony Falls Laboratory 2014).

SAFL research today centers around four major themes:

- Earth surface, water, and life
- Mitigating impacts of global environmental change
- Renewable energy systems
- Biomedical fluid mechanics for personalized health care

All four initiatives are inherently interdisciplinary, involve fluid mechanics as a core expertise, integrate research in the areas where the laboratory has proven strengths and an established record of academic excellence, take advantage of



*SAFL Personnel at the Grand Reopening Ceremony in September 2014 after completion of the SAFL Renovation. Image courtesy of SAFL.*

the SAFL renovation and our unique laboratory and field-scale facilities, and have the potential to benefit society (St. Anthony Falls Laboratory 2014).

SAFL currently houses 23 permanent research staff, along with 18 faculty members affiliated with departments such as civil, environmental, and geo-engineering, Earth sciences, mechanical

engineering, aerospace engineering and mechanics, and ecology, evolution, and behavior. During any given semester, between 40 and 50 students, most of them pursuing graduate degrees, conduct research at SAFL.

Following are a selection of recent river projects that focus around our Earth surface, water, life and renewable energy systems research themes.

## Designing Fish-Friendly Culverts

(Contributed by Jessica Kozarek, SAFL Research Associate)

When roads cross small streams and rivers, structures allowing for the passage of water underneath roadways are critical for unimpeded and safe roadway travel. However, when viewed from a fish's perspective, road crossings, and culverts in particular, can alter flow patterns and streambed habitat, creating barriers to movement within a stream network. When stream habitat becomes fragmented, fish have fewer options to manage stressful conditions, and threatened populations face an increased risk of extinction.

One way to address these concerns is to maintain a natural streambed through the culvert to preserve fish and other aquatic organism passage. When designed properly, recessed culverts, where the bottom of the culverts are set below the streambed, allow for flow patterns and habitat characteristics similar to the stream outside of the culvert. However, questions remain about whether the recessed culvert should be filled with sediment or should be allowed to fill in naturally over time to promote the best culvert or stream stability and fish passage capability.

Recent research at SAFL, sponsored by the Minnesota Department of Transportation, looked more closely at this issue by setting up a number of experiments to investigate sediment transport dynamics of recessed culverts in a controlled setting. SAFL researchers used a tilting bed

flume to create several 1:8 model streams with three different slopes. Using these models, they tested the effectiveness of two culvert installation methods: one in which the culvert was placed below the streambed but not filled with sediment after installation, and another in which the culvert was filled with sediment after installation. Researchers then used a range of flow scenarios—from baseflow to flood events—to observe the resulting sediment transport dynamics.

Results demonstrated that assuming a recessed culvert will fill with sediment after installation is not appropriate for steep, high-gradient streams and in fact, could lead to scour and channel instabilities upstream of the culvert. Inversely, filling the culvert with sediment as part of the installation process allowed sediment transport through the culvert, maintained natural streambed roughness within the culvert and, most importantly, helped to prevent upstream scour and erosion. Using these observations, a number of design recommendations for recessed culverts were developed for state and local agencies concerned about this issue.

*For more information on designing fish-friendly culverts, see the [project report](#).*



*Experimental set up exploring sediment transport dynamics through culverts.  
Image courtesy of SAFL.*

# Sustainable Management of Minnesota Rivers

(Contributed by Jeff Marr, SAFL Associate Director of Facilities and Engineering, and Efi Foufoula-Georgiou, Professor Emeritus of Civil, Environmental, and Geo- Engineering)

SAFL has ongoing research projects focusing on important issues relating to Minnesota's expansive river network. According to the U.S. Environmental Protection Agency (EPA) and the Minnesota Pollution Control Agency (MPCA), the Minnesota River is an impaired system with issues related to high sediment loads, nutrients, and changing hydrology and hydraulics. SAFL has two funded projects underway to support management of this important river basin. The Collaborative for Sediment Source Reduction in the Greater Blue Earth River Basin is a multi-faceted project funded by EPA, MPCA, Minnesota Department of Agriculture, and the Minnesota Agricultural Water Resources Center focused on developing tools for determining the highest value management options to reduce sediment input into the main stem Minnesota River. High levels of sediment in rivers can potentially harm aquatic organisms as well as have a negative impact on recreational use in downstream Lake Pepin. The project seeks to provide tools to help landowners and regulators make informed decisions on how best to mitigate sediment issues on the Minnesota River. Results of the project

have culminated in the development of a model that can link sediment delivery to conservation practices. It can estimate the annual cost and sediment load reductions associated with different combinations of conservation practices at a watershed scale. Local, state, and industrial stakeholders, through a user interface, can 'drive' the model to test different management and conservation strategies for use throughout the watershed, and using such data can ideally help build a consensus of where available funds will have the greatest impact in reducing sediment input to the Minnesota River.

A second project centered around the Minnesota River Basin, titled "Climate and human dynamics as amplifiers of natural change," is an NSF Water Sustainability and Climate program project. The effort is focused on identifying areas in the Minnesota River basin that are highly sensitive to human-natural landscape changes. The project identifies "hot spots" in the basin and provides guidance on where best to focus management efforts to avoid the emergence and undesirable effects of these hotspots.

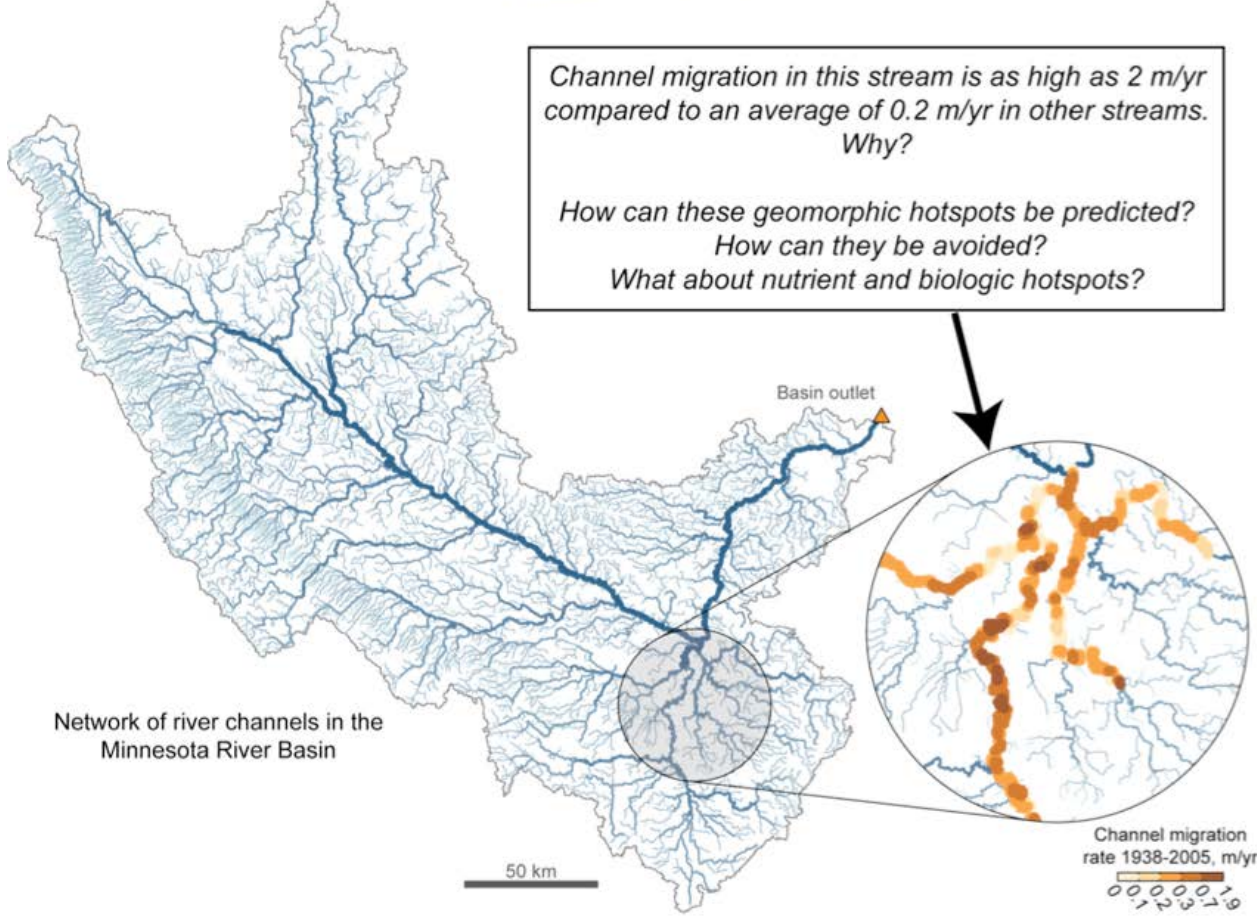
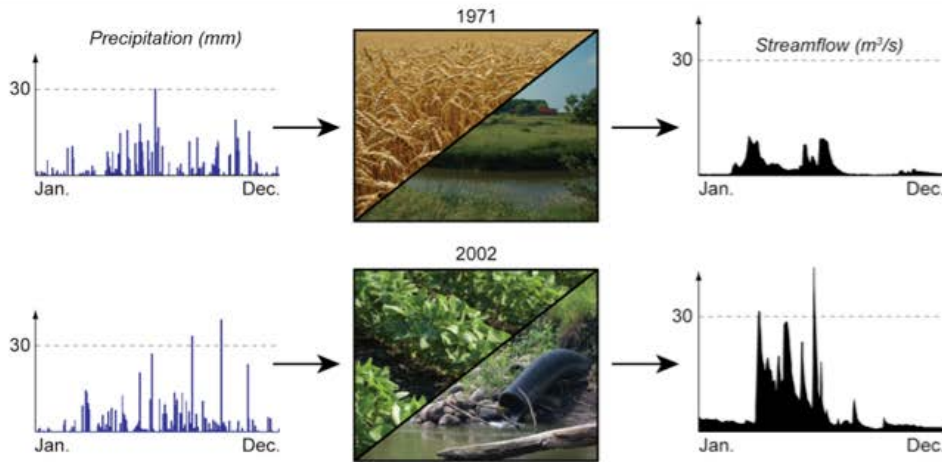
# Road Salt and Water Quality

(Contributed by Andy Erickson, SAFL Research Associate)

SAFL researchers in our Stormwater Research group are currently working on two projects related to chloride pollution in Minnesota. The first is examining permeable pavements as an alternative to using salt-based anti-icing and de-icing materials. It is already well known that permeable pavements reduce runoff during storm

events and increase shallow groundwater flow, supporting baseflow-fed streams and rivers. During winter months in cold climates, some preliminary studies have shown less ice cover on unsalted permeable pavements compared to conventional asphalt pavements, even when salted. The purpose of the study is to quantify

*Agricultural land-use change has amplified streamflows in the Minnesota River Basin:  
Comparison of years 1971 and 2002 where almost the same precipitation  
resulted in a 3× increase in streamflow.  
How does this amplification propagate to changes in sediment, nutrients, and biotic life?*



*Targeted management of geomorphic, nutrient, and biologic hotspots will most effectively improve water quality and the health of aquatic ecosystems.*

*Image courtesy of SAFL.*



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the amount and duration of bare pavement and better understand the underlying mechanisms. The implications are far-reaching in that residential streets in cold climates could be paved with permeable pavements that do not require salting during winter months, substantially reducing salt pollution to the environment.

A second chloride project seeks to evaluate the movement of chloride through unsaturated soils. Some previous studies have shown lag in chloride transport through soils, which applies to the movement of road salt from the surface

to the shallow groundwater as well as chloride from water softening operations. The purpose of this project is to understand the soil properties that affect chloride transport and estimate the long-term residence time of chloride in the soil. With this information, we can better predict the long-term impact of our current road-salt and water softening practices.



*A SAFL student cuts into an experimental delta, revealing the stratigraphy of the deposits.  
Image courtesy of SAFL.*

# Understanding Deltas and Depositional Systems

(Contributed by Chris Paola, SAFL Faculty and Professor of Earth Sciences)

Some of Earth's most vulnerable and important environments, in terms of human life, infrastructure, and biological productivity, are in coastal lowlands and river deltas. River deltas are, literally and figuratively, the thin end of the wedge of environmental response to rising global sea levels. Their dynamics are strongly influenced by physical, biological, geochemical, and human processes, making them an ideal target for SAFL's multidisciplinary approach. Deltaic systems also create sedimentary deposits that host important reservoirs of hydrocarbons and drinking water, which in turn could provide locations for sequestering greenhouse gases.

SAFL researchers are bringing experimental and theoretical methods to bear on understanding the structure and evolution of these critical coastal systems. A major research effort is underway to develop techniques for replicating the effects of wave, tides, and cohesive sediments on delta morphology and dynamics. This is opening the door to studying the influence of these fundamental processes under controlled conditions, something that has not previously been possible.

Initial work using novel sediment mixtures and new ideas about replicating tidal forcing has produced delta landscapes that strikingly resemble those of classic tidal- and wave-dominated deltas from around the world.

In parallel, SAFL researchers are working to develop new theories for predicting delta evolution in response to change. One line of work is the so-called "reduced-complexity" model of delta evolution. While simulating all the details of flow and particle dynamics in a natural delta is still well beyond the reach of even the most powerful supercomputers, by combining "just enough" basic mechanics with rules based on experimental and field observation, we can capture enough of the key processes to reproduce the main elements of delta evolution. Additional work is focusing on the spatial structure of deltaic channel networks, and how this influences vulnerability and resilience, and the sometimes surprising ways in which processes spatially removed (upstream or downstream) from a given point can influence dynamics at that point.

# Investigating a Different Type of Hydropower

(Contributed by Michele Guala, SAFL Faculty, and Mirko Musa, SAFL Ph.D. Candidate)

Hydropower is recognized as a clean, renewable energy, but traditional hydropower, typically generated by dams on rivers, can significantly affect the overall flow regime, sediment transport, and ecology of waterways. Thus, new technologies are being explored that hope to minimize our environmental footprint while continuing to provide

clean, renewable energy. In-streams turbines, also referred to as Marine Hydrokinetic turbines (MHK) or current energy converters (CEC), are a relatively new type of renewable energy technology that harnesses the flowing water of tidal channels and rivers to produce electrical energy. The operating principle is very similar to the classical

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wind energy turbines, albeit here water is the driving fluid that spins the turbine rotor. Like any new technology, many research questions need to be answered before incorporating this new technology into our energy portfolio.

SAFL researchers currently are running different flume experiments that seek to understand how these MHK turbines influence, and are influenced by, sediment loads in rivers. Preliminary results suggest that the configuration of MHK turbine arrays have both local and broader effects in their environment. A local effect includes scour and erosion surrounding the turbine support towers

(similar to the scour observed at bridge piers) and thus is relevant for the structural stability of individual turbines. An observed broader effect is a spatially alternating erosional-depositional pattern that depends on the area and likely the width occupied by the submerged turbine array. Researchers are currently investigating this latter effect to mitigate it, or to exploit it in development for new river restoration strategies.



*MHK model turbines are set in an array in SAFL's main channel for an experimental run.  
Image courtesy of SAFL.*

# The Legacy Continues

In 2018, SAFL will celebrate its eightieth anniversary since its dedication in 1938. Indeed, the legacy initiated by Lorenz Straub is more than just a laboratory building and the equipment it contains. The hallmarks of the SAFL culture are collaboration, collegiality, and openness to new ideas, people, and directions. Research foci develop organically from our collective curiosities and expertise but are also informed by the major challenges confronting society, environment, energy, and health. SAFL looks forward to contributing to the continued success of the University of Minnesota, the College of Science

and Engineering, the state, and society through fundamental research, research training, and outreach for many decades to come.

More information about ongoing research at the St. Anthony Falls Laboratory is available at [www.safl.umn.edu](http://www.safl.umn.edu), as well as information on tours, SAFL's [eNewsletter](#) and links to social media.

*Sections of this article are drawn from the "St. Anthony Falls Laboratory Strategic Plan 2015–2020."*

## References

Marsh, M.H. 1987. *The St. Anthony Falls Hydraulic Laboratory: The First Fifty Years*. Dubuque, Iowa: Kendall/Hunt Publishing Company.

Stefan, H.G., E. Foufoula-Georgiou, and R.E.A. Arndt. "The St. Anthony Falls Laboratory: A Rich History and a Bright Future." Undated internal memo.

Freeman, J.R., ed. 1929. *Hydraulic Laboratory Practice*. New York: The American Society of Mechanical Engineers.

St. Anthony Falls Laboratory. 2014. "St. Anthony Falls Laboratory Strategic Plan 2015–2020." Minneapolis: University of Minnesota.

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## About the Author

Barbara Heitkamp is the communications specialist for the St. Anthony Falls Laboratory. She joined the SAFL technical staff in August 2011 and moved into the communications position in June 2014. Her technical background is in geology and hydrology, with a B.S. degree in geology from Texas Christian University and an M.S. degree in water resources science from Oregon State University.

FEATURE

# AGRICULTURE AND THE RIVER: THE UNIVERSITY'S ROLE IN SOCIETAL LEARNING, INNOVATION, AND ACTION

By Nicholas R. Jordan, Carissa Schively Slotterback,  
David Mulla, and Len Kne

**R**ivers are critical connectors across our communities, states, and national boundaries.

They offer essential benefits in the form of drinking water, recreation, transport, food, and



*Eroded stream and river banks allow excess sediment — primarily clay and silt — into waterways. Sediment is considered a contaminant and contributes to cloudy, murky water, which degrades habitat for fish and aquatic life. Image via MPCA Photos, Flickr.*

aesthetics. At the same time, human activities, from agriculture to urban land use, affect rivers profoundly. The stewardship of rivers is a complex problem: rivers must meet many needs of society, which often conflict, and all sectors of society need to be involved in finding solutions. We believe that universities, especially land-grant universities such as the University of Minnesota, are well positioned to play a distinctive and necessary role in addressing these complex problems of rivers, stewardship, and water. In this article, we identify some of these problems and the approaches that University of Minnesota researchers and community partners are taking to address them, including discussion of the “The Forever Green Initiative” and the New Agricultural Bioeconomy Project.

Among the many urban and rural activities that affect the Mississippi River, agriculture is one of the most significant. Water is essential for the growth of crops and animals, of course, but there are many other links. Agriculture requires control of stocks of water stored in soil, and of the flow of water across landscapes. In the river basin, extensive constructed systems provide rapid drainage of precipitation from watersheds, so that soils can warm and dry rapidly in the spring, allowing summer crops to grow. Agriculture and water resources are also linked by their vulnerability to extreme weather events—both droughts and heavy rainfall create challenges—and by the need for rivers to transport products. Therefore, we must think about the future of agriculture if we are to think about the future of the river. In

this essay, we argue that the future holds major opportunities for agriculture to improve water resources, if society can seize them.

The agriculture-water relationship—now and in the future—is complicated; it has been marked by polarized debate and controversy in recent years. Complexity, uncertainty, and controversy increase further when possible climate change becomes part of the conversation. Forecasts of climate change in the basin project significant changes in water, including heavier rainfall events, and longer intervals between rains. If these forecasts prove accurate, there will be substantial impacts on both agriculture and water. There is much uncertainty surrounding many of the projected impacts, making it far from clear how agriculture and water systems sectors can and should respond. Yet, food and water are indispensable life-support systems of civilization, and their continued availability—and the health of critical elements of these systems, such as rivers and farm economies—must be ensured. Therefore, the challenge of managing these intertwined life-support systems in a time of potential climate change cannot be ignored. Such complex or “wicked” problems are very difficult for society to manage, because they are intrinsically complex and dynamic, with many interconnected and poorly understood facets in flux. Crucially, different people understand these problems very differently, in terms of their basic nature and potential solutions, making the problems intrinsically controversial.

## The University’s Role

How can society address wicked problems such as the nexus of agriculture, water, and the river? We believe that all societal sectors must play a role, including private, public, and civil-society sectors, and that universities are positioned to play a distinctive and necessary role. The University

of Minnesota can play a central organizing role in addressing these problems. We argue that the university must become fully engaged in these problems, and above all seek to promote society’s capacity to cope with their complexity, controversy, and uncertainty. The best coping

strategies involve processes of societal adaptation that involve ongoing learning, innovation, and collaborative action. We believe that the university has particular roles to play in all three

elements. We briefly sketch the university's roles, and then discuss them in the context of the interconnections among water, agriculture, and climate change.

## Learning

In the face of complexity and controversy, identification of pathways forward must draw on principles of transdisciplinarity, meaning that many different knowledge sources and world views must come together to develop and improve understanding. Learning how to work this way must be informed by systemic understanding of factors on many scales and dimensions, and take into account the diverse interests, ethics, experience, history, and capabilities of affected people and communities. Critically, this learning must be deliberative and anticipatory. It must strive to come to judgment about what courses

of action should be undertaken for the common good, and it must be prudent in considering possible future scenarios to which society must adapt. Such learning processes are widely seen as critical to the very future of civilization, but capacity to organize and sustain them is scarce at present. Learning must be first organized, and then sustained, as complex problems evolve, with the understanding always incomplete and in need of revision and expansion. We contend that large public universities are almost uniquely capable of initiating, facilitating, and providing ongoing support for the necessary learning.

## Innovation

The second critical role for the university is to support innovation linked to learning. Public research universities, such as the University of Minnesota, are able to provide a wide range of support for innovation (spanning technology, knowledge and other human capital, and social/organizational forms of innovation). If the societal learning process envisioned above can identify

a particular pathway forward, then the comprehensive university can serve as a central node (or cluster of nodes) in a network of innovation that spans the full range of innovation needed to pursue a pathway forward. Again, we see public research universities as having a unique capacity to organize and integrate the coordinated innovation that is necessary.

## Coordinated Action

Implementation of innovations to meet critical societal needs must involve carefully planned and staged activities that test and refine the necessary innovations across social, knowledge, and organizational domains. Public, private, civil-society, and knowledge institutions (like universities)

have essential roles in sharing and management of resources and risk. The products of coordinated innovation must prove their legitimacy in economic, legal, political, and cultural domains. A variety of coordination and collective action challenges and tensions must be managed. We

contend that the university is the only institution with a compelling interest in supporting the full scope of implementation and coordination work that is needed to address complex opportunities and challenges such as the agriculture/water/river nexus.

Finally, learning, innovation, and coordinated action are not stand-alone processes. Rather all three must be linked together into a larger system that can orchestrate and articulate each of the three, all of which are ongoing simultaneously across a range of scales and domains.

# Working for the River: The Forever Green Initiative

Of course, it will be very challenging for the university to address the future of the river by playing the roles outlined above. Each requires significant shifts in some aspects of how the university approaches learning and research. However, we believe that such new roles are best learned by practice. We now turn to a brief portrait of the Forever Green Initiative (FGI), a broad-based project, now in its fifth year but building on many years of groundwork. The FGI is working to play all of the roles described above—learning, innovation, and coordinated action—in relation to the future of agriculture, water, and climate in the Upper Midwest. Based at the University of Minnesota, the FGI is a broad-based project, involving many partners in commercial, research, and conservation sectors. FGI's goal is to substantially increase the quantity and variety of marketable agricultural products produced by Midwest agriculture and thereby to achieve previously unattainable solutions to the state's water-quality challenges. The FGI has been underway, as a formal initiative, for almost five years, funded by both public and private sectors. FGI is organized and governed as a network; currently, it links about 100 faculty, graduate students, and research staff at the University of Minnesota, and many partners in the public, private, and non-profit sectors, and at other universities.

FGI is guided by this widely shared premise: by carefully measured addition of biological diversity to current agriculture, we can sustainably provide food and water to society, and adapt to a changing climate. To support this diversification, FGI is developing a broad portfolio of some 15 winter-tolerant and perennial crops. New breeding technologies are being applied to make rapid improvements in these species, along with new methods for designing sustainable farm production systems, for utilizing the crops in new products, and for “de-risking” potential investments in these crops and technologies for entrepreneurs and investors.

FGI is fundamentally driven by a major new opportunity that is now emerging from agriculture. The agricultural sector is entering a highly dynamic phase, propelled by the emergence of a new, more broadly based agricultural “bioeconomy.” This new bioeconomy is building on the strengths of current agriculture by integrating new crops and providing feedstocks for a wide range of new bio-based products. These include a wide range of food, nutrition, health, industrial products, and fuels, propelled by diverse entrepreneurship and technological innovations in processing and manufacturing. In the U.S., the industrial bioeconomy was estimated at approximately \$110 billion in 2010, and the economic sector is projected to grow



rapidly over the coming decade, with potential to create some 12,000 permanent jobs in Minnesota alone. The emergence of this bioeconomy is also driving increases in total agricultural production: diversifying agriculture with new crops enables substantial increases in total production by making better use of soil, water, nutrients, and solar energy. Together, these increases in the quantity and variety of marketable agricultural products are creating major economic opportunities that are driving rapidly growing investments.

How can these economic trends in agriculture **also** provide a new opportunity to expand and enhance water resources, and thus to improve the health of the river? The opportunity exists because the emergence of the new bioeconomy is creating demand for certain agricultural crops that can be used to **both** provide revenue for farmers and the agricultural sector **and** improve water quality. Previously, most farmers were unable to grow many perennial and winter-tolerant annual crops, because no markets existed. Now, emerging markets can provide substantial revenue from these crops, by production of high-value feedstocks for the growing bioeconomy. Water quality improves because these crops enable new land and water management strategies that improve water quality. For example, winter-tolerant annual oil-seed crops such as camelina and pennycress can provide substantial yields of oils suited to many industrial, edible, and fuel applications, while providing water conservation benefits of cover crops. Emerging perennial grass crops such as cordgrass can provide large yields of biomass feedstocks while providing benefits of riparian buffers. Emerging perennial grain crops such as intermediate wheat grass (Kernza) can supply food systems with sustainably sourced ingredients for most food made from wheat. Careful scientific analysis (e.g., [MPCA Nitrogen in Minnesota Surface Waters](#) report) has affirmed

the potential of these options for addressing water-quality challenges associated with agricultural practices. Indeed, much evidence suggests that extensive and carefully targeted diversification of agriculture with new, revenue-producing crops is the only feasible option for meeting overall water-quality goals for many Midwest states.

Water-quality benefits result because diversification of perennial and winter-tolerant crops increases the coverage and protection of soil, reducing the runoff, erosion, and loss of soil and nutrients that can occur when farmland is not covered by living plants. Our current agriculture is dominated by crops that grow during the summer, requiring large inputs of fertilizer and leaving bare soils for much of the year. By adding perennial and winter-tolerant crops, we can improve water quality because these crops are actively transpiring during most of the year, including many periods in fall, winter, and spring when summer crops are absent. For this reason, perennial and winter-annual crops—working in tandem with summer annuals—can capture solar energy, water, and nutrients with high efficiency. Water quality benefits result because water runoff is minimized, as are losses of soil and nutrients into waterways. In addition, these crops can enhance soils and wildlife, including pollinators, fish, and game. Adding perennial and winter-tolerant crops to our current agriculture—where these will be profitable for farmers and efficiently protect water quality—is a very promising opportunity to address water-quality challenges that affect the Midwest and its rivers. To capitalize on this opportunity, learning, innovation, and coordinated action are needed, as outlined above. The goal is to add crops such as camelina and Kernza to our current agricultural production systems, while also developing profitable markets for these new crops. FGI is working toward that goal.

# The New Agricultural Bioeconomy Project

One promising on-the-ground effort that illustrates the FGI approach of societal learning, broad-based innovation, and coordinated action is the New Agricultural Bioeconomy Project. The project is associated with FGI's portfolio of work. It is exploring watershed-scale agricultural scenarios that produce win-win outcomes for the watershed's economy and its water resources. The project is based in the 24,000-acre Seven Mile Creek Watershed in Minnesota, which flows into the Minnesota River and ultimately into the Mississippi River. The project was initiated in 2012 by the University of Minnesota and engages researchers from a wide range of disciplines including agronomy, soil science, urban planning, extension, applied economics, and geographic

information sciences. Critically, the project also engages stakeholders from a broad range of organizations, including local communities, state regulatory agencies, agricultural commodity groups, environmental advocacy NGOs, economic development organizations, and farmers. While the project is based in Minnesota, the complexity of issues and stakeholders is representative of many other communities at the nexus of water and agriculture.

In the first stage of this work, the university team convened a diverse stakeholder group and collaborated with them to explore tradeoffs and impacts of food and biomass production on economic value, water quality, carbon

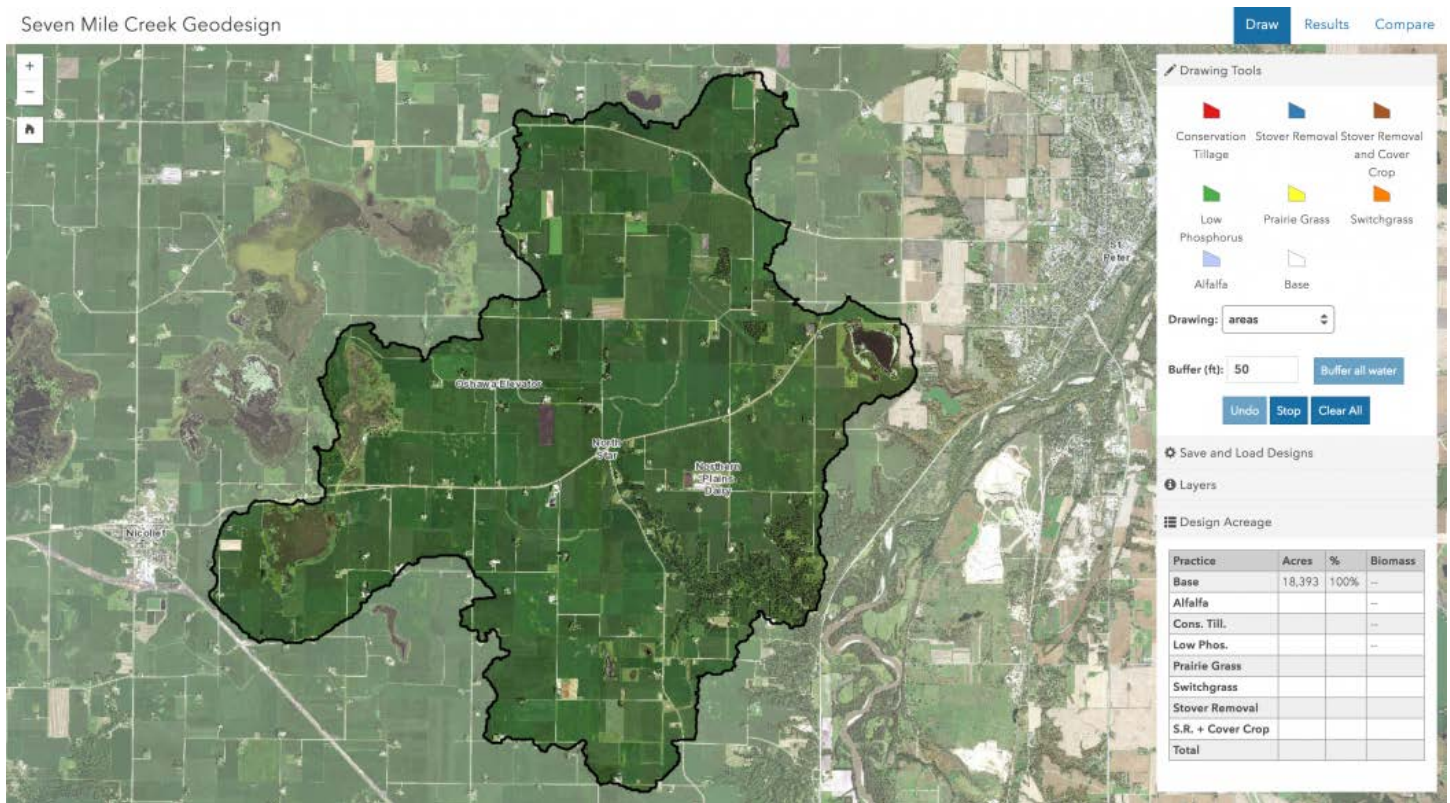


*Stakeholders worked in groups to explore potential scenarios for biomass production in the Seven Mile Creek Watershed. A large touchscreen display allows participants to work collaboratively on designs. They are provided with several reference layers to help them decide where to make design choices. Image courtesy of Carissa Schively Slotterback.*

sequestration, and habitat. Thus far, the university team, including but not limited to the authors of this essay, facilitated a two-phase collaborative stakeholder process that included an initial exploration of stakeholders' values and broader trends that will shape the future of agriculture and environment in the coming years. Using well-established approaches to facilitating collaboration among stakeholders representing diverse perspectives, the university team engaged stakeholders in jointly exploring potential design strategies that could be applied to the landscape in order to achieve outcomes that were both economically viable and environmentally beneficial. This joint exploration shows what broadly inclusive societal learning processes look like, on the ground. The groups arrived at strategies that were perceived by most participants, across the range of participating sectors, as enhancing the

common good for the region by enhancement of current agricultural land use.

The stakeholders then had the opportunity to shift to a second, innovation-focused stage, which built upon the design strategies they had produced. To begin this stage, participants were invited to engage in an intensive process of design thinking. In this process, participants worked to design carefully diversified landscapes that used perennial and winter-hardy crops to enhance total agricultural production in the watershed, add value to current crop production, and to expand and enhance water resources (and soil and wildlife as well). This shift enabled the group to identify innovative landscape designs that could enhance both the regional farm economy and regional water resources. These accomplishments of the group were enabled via geodesign,



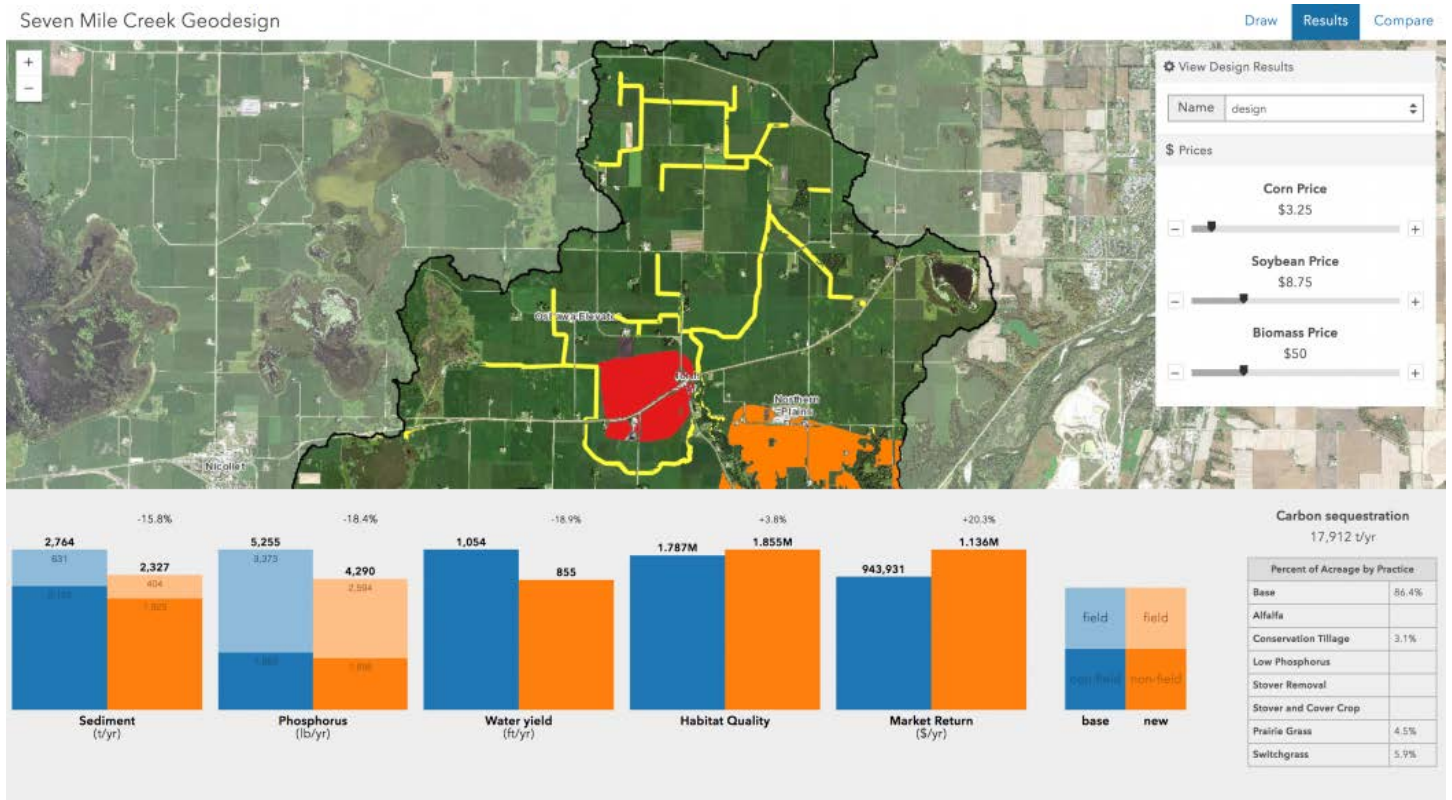
*Seven alternative practices can be applied to the landscape. Participants draw on the map using tools that quickly create shapes or buffer waterways. Image courtesy of U-Spatial.*

a novel decision-support and visualization tool that allowed them to develop potential landscape designs and assess their performance. This decision support and visualization tool consists of a mobile 55" multi-touch display linked to a spatial geodatabase that contains information about topography, soil, land use, hydrology, and habitat characteristics for the watershed. In addition, the tool contains data and modeling about how placement of each of the alternative landscape management practices (e.g. tillage, fertilizer, cover crops, perennial crops) will affect provision of environmental benefits (e.g. controlling runoff and erosion to improve water resources, carbon sequestration, production of food, and renewable energy). Stakeholders were able to quickly and iteratively try many designs with immediate feedback. When asked about the process, one participant stated:

*There's a real key benefit of this process. You know, getting different kinds of people together.*

*Having them discuss a problem, communicate, and working out some things and they may not all agree from the get go of a course, . . . but if they have at it with the decision making software and you can kind of look at your landscape model and the benefits. Not only the cost benefits, but environmental as well, you know, and that's kind of the . . . objective decider for the group.*

This second stage engaged additional economic development stakeholders and explored issues of supply chain relative to biomass production, harvest, and processing. The researchers facilitated a scenario planning process that accounted for broader agricultural and economic trends and again utilized the geodesign system to assess the biomass demand, landscape design options, and economic and environmental benefits. Various biomass processing facility types were considered in these scenarios as a demand driver for biomass crops that could be integrated into the agricultural landscape. Following the completion



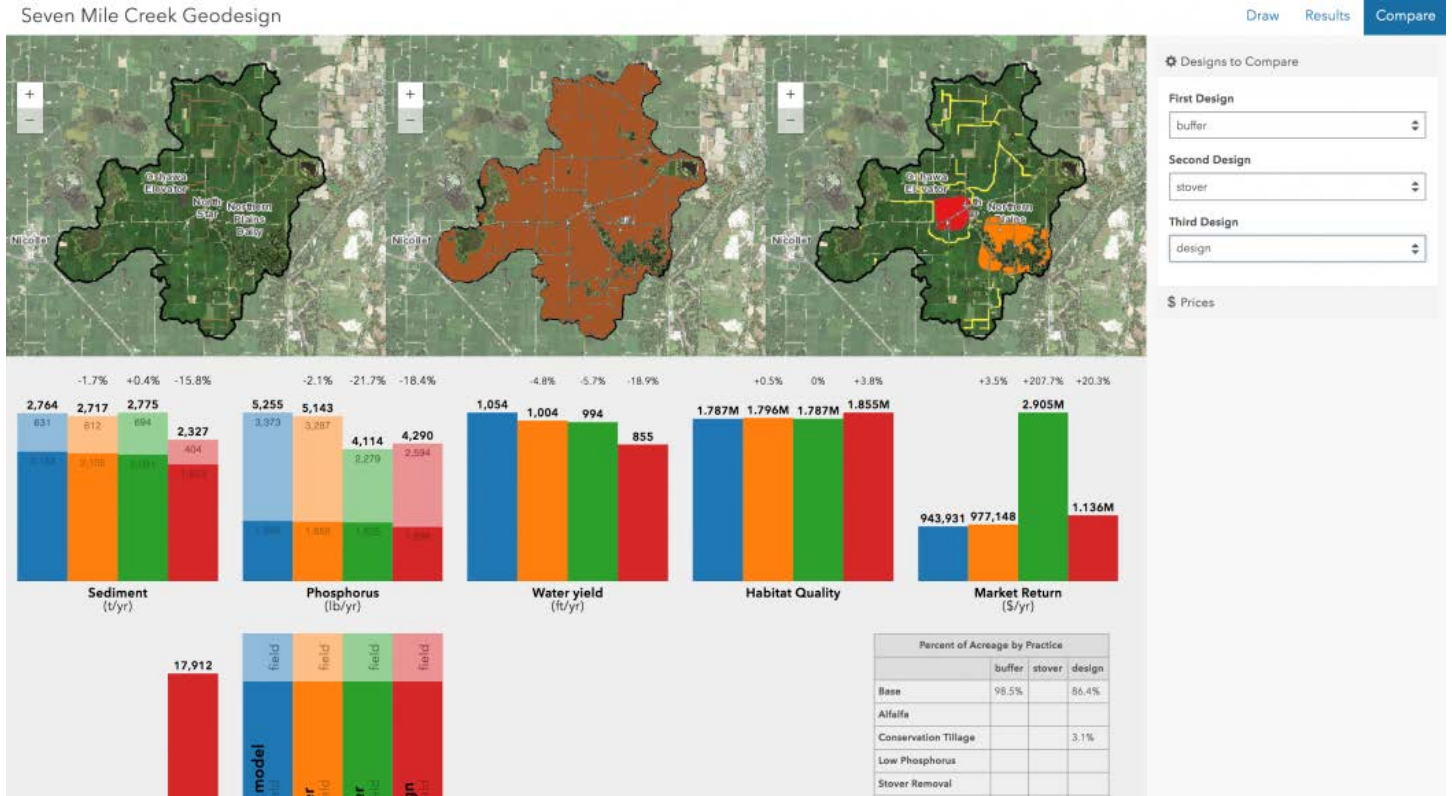
*At any time, participants can submit a design to be evaluated. Within a few seconds, they are provided with performance of the design in terms of water quality, habitat, and financial parameters. Image courtesy of U-Spatial.*

of the innovation stage, the researchers and stakeholders remain active collaborators on implementation work teams focused on biomass facility recruitment strategy, alfalfa production for a local dairy, and downscaling watershed models to farm scale.

Current work illustrates the third stage of FGI’s approach, which focuses on carefully coordinated implementation. By supporting a range of partners in taking measured steps together, the project aims to manage the risks and costs, and maximize the benefits of a substantial innovation in local agriculture: producing alfalfa and winter-hardy “cash-cover crops” in and near the Seven Mile Creek, in a spatial pattern across the watershed that cost-effectively produces environmental benefits in addition to revenues for farmers and materials for the local economy. These winter-hardy crops protect and enhance soil and water resources over fall, winter, and spring, and produce good yields of valuable commodities before giving way to summer crops

like corn. By implementing these innovations in a series of carefully staged steps, project participants are working to realize the full potential of the project to benefit the local farm economy, meet local health and infrastructure needs related to municipal water supplies, and improve the flows of water from Seven Mile Creek into the Minnesota and Mississippi Rivers.

The project will achieve these outcomes by coordinated action to leverage economic growth opportunities for farmers and rural communities that are arising from increased market demand for products produced from certain crops and cropping systems. By changing land use and farming practices to meet this demand, farmers can play a major role in meeting water needs at far lower public cost than building treatment facilities or purchasing land or restrictive easements. More broadly, we aim to create a scalable model of private- and public-sector collaboration that will 1) focus investments needed to achieve these low-cost, multiple-benefits approaches to



*The design process is iterative. Participants can compare the performance of up to four designs in search of a win-win scenario. Image courtesy of U-Spatial.*

water service provision; 2) connect producers of perennial and winter-annual crops to markets that provide revenue to producers; and 3) support

ongoing learning, innovation, and coordinated action for implementation and adaptation to change.

## Conclusion

Managing the nexus of agriculture, water, and the river presents society with a complex or wicked problem challenge, but also many opportunities. Collectively, society has a great deal of capital—intellectual, human, social, and financial—that can be used to manage the problems and seize the opportunities. Yet, this capital is dispersed, and its owners are reluctant to spend it in the highly fragmented, polarized, and uncertain conditions that surround current discourse and debate around agriculture, water, and climate. The university is, among social institutions, uniquely capable of convening and supporting the societal learning, broad innovation, and coordinated

action that are essential to address issues related to agriculture, water, and a climate for the common good. However, the university must learn to do such complex work better, and in full engagement with a wide range of collaborators. The Forever Green Initiative and the New Agricultural Bioeconomy Project are deliberate experiments in which the University of Minnesota is practicing and refining its new roles and relationships. In ten years, we hope that the results will become very clear, through an increased diversity of the agricultural landscape and improved health of the river.

## Recommended Citation

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Nicholas R. Jordan is a professor in the Agronomy and Plant Genetics Department at the University of Minnesota. In his teaching and research, he focuses on organizing systemic change in food and agricultural systems.

Carissa Schively Slotterback is an associate professor of urban and regional planning in the Humphrey School of Public Affairs at the University of Minnesota. Her research is focused on stakeholder engagement and decision making related to environmental, land use, and transportation planning. She is particularly interested in how stakeholders perceive impacts and use information in making decisions, focusing on impact assessment, collaborative decision making, and sustainability planning approaches.

David Mulla is a professor and the W.E. Larson Chair for Soil and Water Resources in the Department of Soil, Water, and Climate at the University of Minnesota. He is an internationally recognized scholar in agricultural watershed modeling and management for improved water quality.

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Len Kne brings extensive experience with GIS and Information Technologies in higher education, construction, government, and non-profit organizations to his work at U-Spatial, a center at the University of Minnesota providing support for spatial research. He is on the faculty of the Master of Geographic Information Science program and teaches project management and spatial databases. He is looking forward to the day when everyone is thinking spatially.

PRIMARY SOURCES

# “PLAYGROUND OF THE PEOPLE”? MAPPING RACIAL COVENANTS IN TWENTIETH-CENTURY MINNEAPOLIS

By Kirsten Delegard and Kevin Ehrman-Solberg

In the summer of 2014, veteran property researcher Penny Petersen led a group of

Augsburg College undergraduates on a history quest at the Hennepin County Government



*Aerial view of South Minneapolis looking east toward Lake Nokomis from Washburn High School circa 1928. Image used with permission of the Minnesota Historical Society.*



Center. Under Petersen’s tutelage, the student interns for the Historyapolis Project searched at the Registrar and Recorder’s Office for critical lines of text that could illuminate the hidden history of race in Minneapolis during the twentieth century. They were looking for racially restrictive deeds—or racial covenants—which barred people who were not white from owning property. These kinds of deeds were the most powerful instrument of segregation in the urban north during the twentieth century.

The students were quickly overwhelmed. The text they were seeking could only be found by scrolling through millions of property records on microfilm reels. But Petersen was inspired. And she decided that she would do what no one had ever done. She would track when and where restrictive deeds were embedded in the urban landscape of Minneapolis.

This was the beginning of the Mapping Prejudice project, which has brought Petersen together with scholars and students from Augsburg College and the University of Minnesota to unearth and map racially restrictive property deeds in Minneapolis.

During the first half of the twentieth century, real estate developers and public officials used covenants to build what amounted to a hidden system of American apartheid. Unlike segregated bathrooms or watering fountains, racial covenants were largely hidden from the public eye in bound volumes at the county. But in Minneapolis and elsewhere, these property contracts were the bulwarks of white supremacy.

Mapping Prejudice began in earnest when Peterson sampled approximately 20,000 Minneapolis properties and found over 5,000 deeds with racially restrictive language. The project has since identified an additional 25,000 restrictive deeds located throughout Hennepin County. Once these records are processed, the Minneapolis covenants will be added to Peterson’s initial sample. The resulting database will serve as the basis for the first-ever comprehensive visualization of racial covenants for an American city.

The deeds tell a sobering story of racial exclusion. In tandem with redlining—a banking practice that made it impossible to get loans for properties in racially mixed neighborhoods—racially restrictive deeds in Minneapolis shut African Americans out of property ownership. In the mid-twentieth century, homeownership was an emblem of American citizenship as well as what scholars have called the “greatest mass-based opportunity for wealth accumulation in American history.”[i]

The work started with the Historyapolis Project at Augsburg College, which is committed to working with students to document some of the more challenging aspects of the past in Minneapolis. But after visiting the property records office with Petersen in 2014, project director Kirsten Delegard realized she lacked the expertise necessary for this kind of systematic inventory.

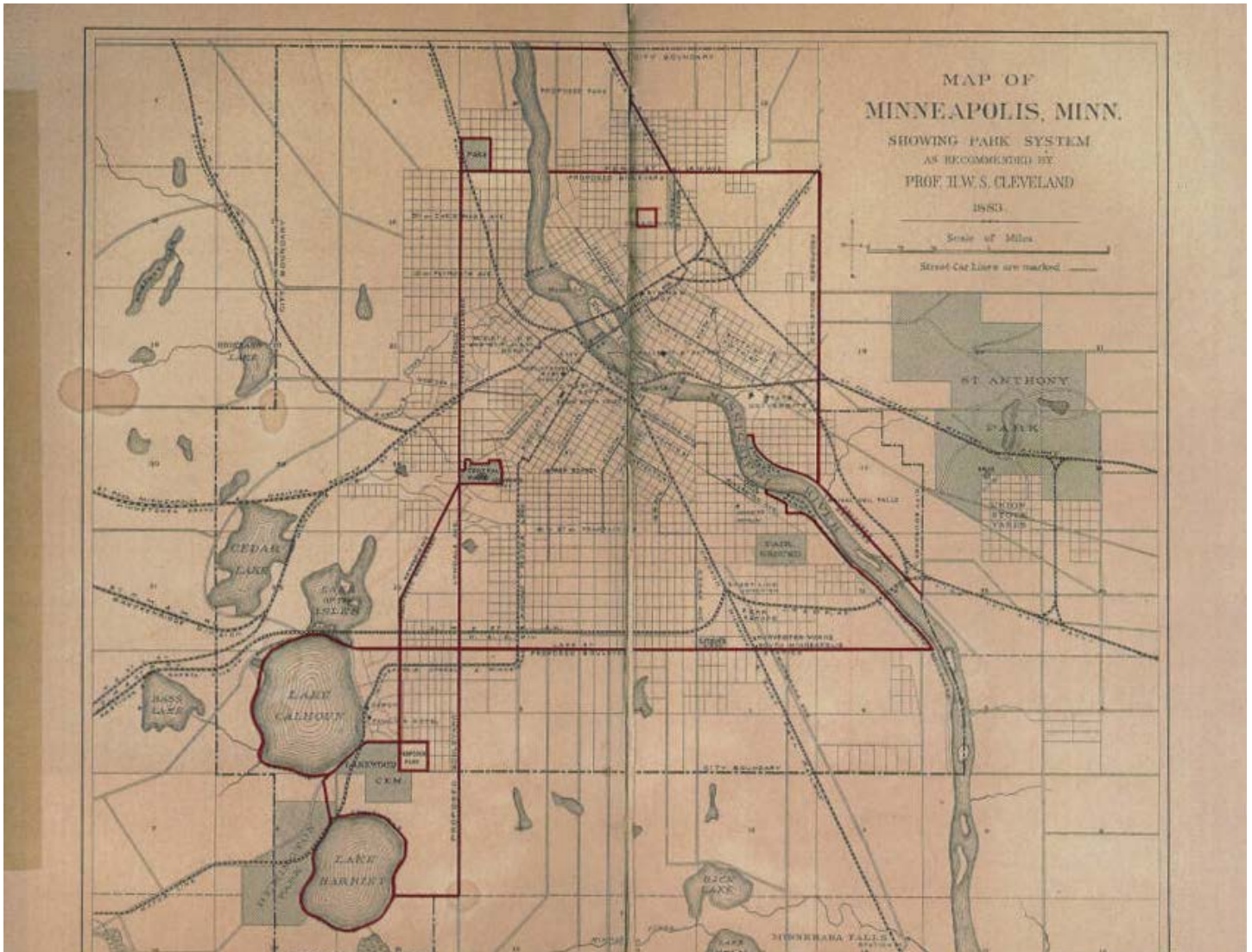
Fortunately, Petersen was fascinated by the challenges of this research. In 2015, she began assembling a database that would grow to include

The party of the second part hereby agrees that the premises hereby conveyed shall not at any time be conveyed, mortgaged or leased to any person or persons of Chinese, Japanese, Moorish Turkish, Negro, Mongolian or African blood or decent. Said restrictions and covenants shall run with the land and any breach of any or either thereof shall work a forfeiture of title, which may be enforced by re-entry.

*A typical Minneapolis restriction. This example comes from a home along West River Road in the Longfellow Neighborhood. Image courtesy of the Hennepin County Registrar’s Office.*

several thousand restrictive deeds. Delegard then enlisted Kevin Ehrman-Solberg, a graduate student in the GIS program at the University of Minnesota, who works at the school's Borchert Map Library. Ehrman-Solberg began to map the deeds located by Petersen and soon became the project manager, masterminding the effort to build the databases necessary for this visualization. With the support of University of Minnesota librarian Ryan Mattke, Delegard, Ehrman-Solberg, and Peterson made the Borchert Library their base of operations. They decided to work together to document the spread of racial covenants across Minneapolis.

Racial covenants began in California in the 1880s[ii]. By the early twentieth century, they had spread to the urban north. The earliest deed restriction Mapping Prejudice has identified was recorded in 1910 in South Minneapolis, when Henry and Leonora Scott sold a property on 35th Avenue South to Nels Anderson. The deed conveyed in that transaction contained what would become a common restriction, stipulating that the “premises shall not at any time be conveyed, mortgaged or leased to any person or persons of Chinese, Japanese, Moorish, Turkish, Negro, Mongolian or African blood or descent.” Scott became the first president of the Seven Oaks Corporation, a real estate developer that inserted



*1883 map of Minneapolis, MN showing the park system and Grand Rounds route as recommended by H. W. S. Cleveland. Image via Hennepin County Library.*

this same language into thousands of deeds across the city.

Scholars like Kenneth Jackson and Tom Sugrue have documented how deeds like these had the enthusiastic support of both public officials and private industry across the United States during the twentieth century.[iii] Real estate developers created them. The Federal Housing Authority endorsed them. Bankers and property owners embraced them as a way to protect property values. In 1948, The Supreme Court declared them unenforceable after a sustained legal campaign by the NAACP. They were banned in Minnesota in 1953. But they remained in use across the country until 1968, when the Fair Housing Act made them explicitly illegal.

This legal history has been told. But no one has ever made a complete map of these restrictions, thanks to the difficulties of extracting this kind of information from the historic records. Petersen demonstrated how to find these kinds of deeds. But a comprehensive survey and visualization would have been impossible without the help of computers.

In 2016, Hennepin County gave Mapping Prejudice access to its database of digitized property deeds. This database contained every warranty deed abstract recorded between 1900 and 1960, for a total of over 1.4 million records. This dataset allowed the team to build an innovative new protocol for mapping covenants. The deeds are scanned for racial language using Optical Character Recognition (OCR) software. Flagged deeds are fed into a crowd-sourcing research platform called Zooniverse. Students and community volunteers use this platform to answer a series of questions about the flagged deed images. This crowd-sourced data is then exported into a spreadsheet and mapped using ArcGIS. This computer-assisted research is building on the work done by Petersen to unearth the structural racism embedded in the physical landscape of Minneapolis.

The maps that have emerged from this initial research are prompting questions that extend beyond the realm of housing. Neighborhoods fronting parklands exhibit the highest concentration of covenants we have found thus far. While Minneapolis parks were never explicitly segregated, the sheer number of racial covenants surrounding them indicates that access was anything but equal.

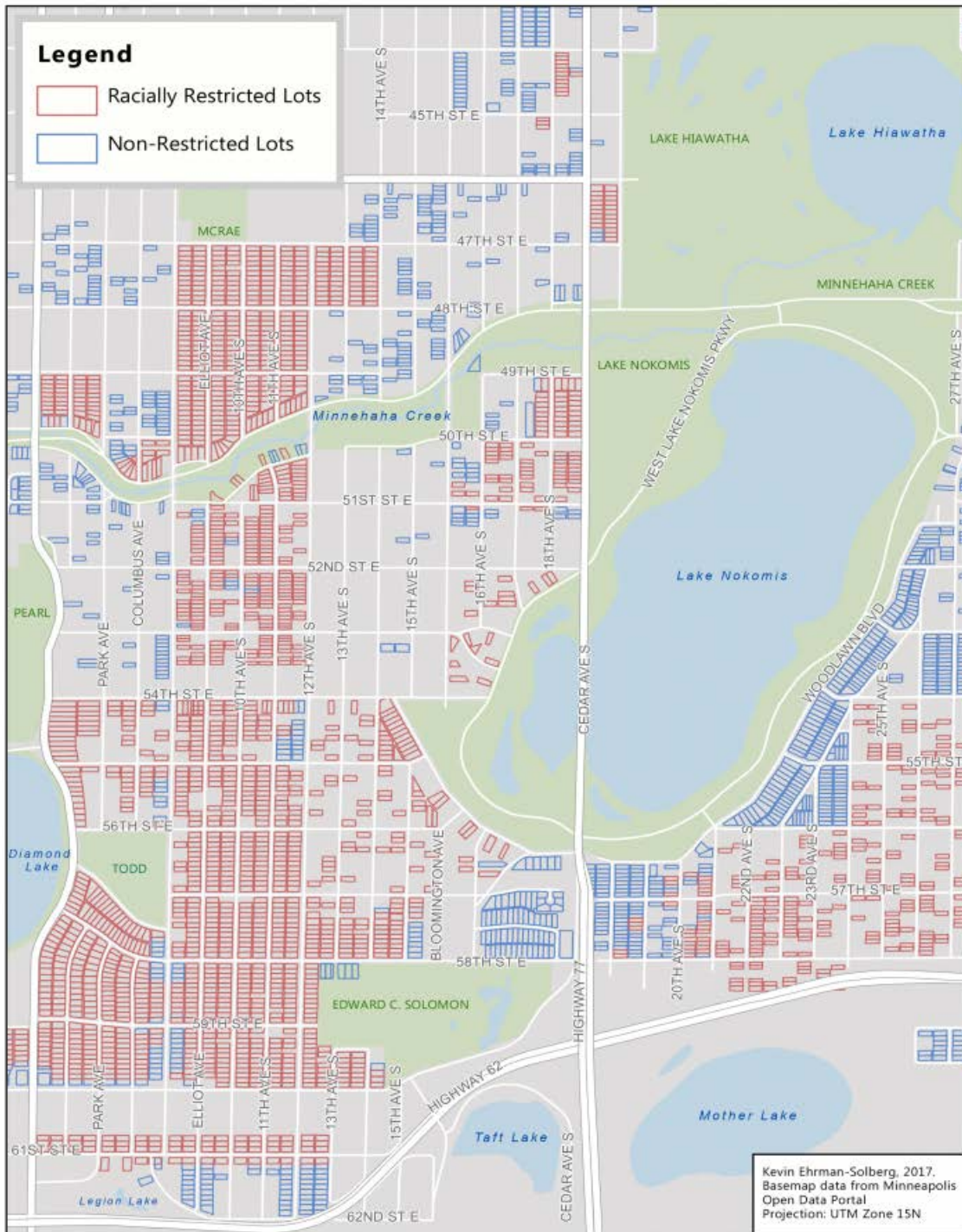
These early patterns call into question some of the central assumptions of civic life in Minneapolis, highlighting the need for more nuanced understandings of how race has shaped public space in the city.

Minneapolisians love their parks, which have been named the nation's best by the Trust for Public Land for several years in a row. From its beginning in 1883, the Minneapolis Park Board sought to acquire all the land bordering streams, lakes, and rivers. This strategy created the nationally renowned Grand Rounds, the 60 miles of public trails and parkways that meander along Minnehaha Creek to link the Mississippi River gorge to the Chain of Lakes. This carefully planned green space transformed Mill City into the City of Lakes in the early twentieth century.

Residents like to brag that their waterfront is the playground of the people. But the initial visualizations generated by Mapping Prejudice show that some of the most desirable green spaces in the city were ringed by residential districts that barred people of color from taking up residence. The result was an invisible racial cordon around the city's urban commons.

These maps illustrate how racial covenants blanketed neighborhoods adjoining some of the most spectacular holdings of the Minneapolis Park system. Several neighborhoods around Minnehaha Creek, Lake Nokomis, and Diamond Lake were almost completely restricted. The empty space you see on this map likely contained additional covenants.

## Lake Nokomis and Minnehaha Creek



*South Minneapolis, especially the neighborhoods around Lake Nokomis and Diamond Lake, had the highest concentration of racial covenants the project has found thus far. Image courtesy of Kevin Ehrman-Solberg.*

## Seven Oaks and West River Parkway



*Many of the homes lining West River Road along the Mississippi River in Minneapolis were off-limits to anyone who was not white. Image courtesy of Kevin Ehrman-Solberg.*

By the mid-twentieth century, much of the Grand Rounds was encircled by neighborhoods that excluded people who were not white. This pattern of exclusion demonstrates the need for new work that re-examines how access to Minneapolis parks and waterways was shaped by race.

This inquiry speaks to a growing body of research on the legacy of racism in American green spaces. [iv] Over the last decade, scholars have brought new attention to this topic, illuminating how seemingly race-neutral parks and green spaces were racialized through interlocking practices. “Whites only” signs were just one of the mechanisms that made urban green space unwelcoming to African Americans.

This scholarship bolsters the campaign by grassroots activists associated with [the local NAACP](#) and [Parks and Power](#) who are pushing the

Minneapolis Park Board to incorporate racial equity into its strategic planning and administrative processes. The Trust for Public Land, which has given Minneapolis such high marks for its parks, only considers park acreage, per capital spending, and the numbers of residents who live within a half-mile of a park. But the quality of American parks, [journalist Brentin Mock concludes](#), after surveying this literature, can no longer be assessed without a consideration of race.

The visualizations that are emerging from the Mapping Prejudice project provide critical historical context for this ongoing dialogue. The project seeks to catalyze community conversations about past injustices that can chart productive ways to address current disparities.

## Footnotes

[i] Melvin L. Oliver and Thomas M. Shapiro, *Black Wealth/White Wealth: A New Perspective on Racial Inequality* (New York: Routledge, 1995), 18.

[ii] M. Jones-Correa, “The Origins and Diffusion of Racial Restrictive Covenants,” *Political Science Quarterly*, 2000 Winter, 115(4), 541–568.

[iii] Kenneth Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York: Oxford University Press, 1985): 208–209.

Thomas J. Sugrue, *The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit* (Princeton: Princeton University Press, 2005, Classic edition): 44–46.

[iv] See, for example, Carolyn Finney, *Black Faces, White Spaces: Reimagining the Relationship of African Americans to the Great Outdoors* (Chapel Hill: The University of North Carolina Press, 2014).

## Recommended Citation

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## About the Authors

Kirsten Delegard is a scholar-in-residence in the history department at Augsburg College. She is the founder of the Historyapolis Project, which uses digital tools to explore some of the darker aspects of the past in Minneapolis. Her work about Minneapolis can be found on the Historyapolis blog [historyapolis.com]. She has recently published “Contested Geography: The Campaign against Pornography and the Battle for Urban Space in Minneapolis,” in *U.S. Women’s History: Untangling the Threads of Sisterhood*.

Kevin Ehrman-Solberg is a student in the Master of Geographic Information Science (MGIS) program in the Department of Geography, Environment & Society at the University of Minnesota. He is also the project manager for Mapping Prejudice and a graduate assistant at the Borchert Map Library. His most recent article, “The Battle of the Bookstores and Gay Sexual Liberation in Minneapolis,” came out in fall 2016 in the *Middle West Review*. For more on Kevin’s work, visit his [website](#).

IN REVIEW

# ONE RIVER: TELLING STORIES OF THE ST. LOUIS RIVER

By Phyllis Mauch Messenger

In northeast Minnesota, the St. Louis River winds for 192 miles from Hoyt Lakes to St. Louis Bay, where it empties into Lake Superior. Along the way, people paddle on the river, they use its waters, they enjoy its beauty, and sometimes they fear it. People tell stories; legends are passed down. In fall 2016, some of these

stories and legends were woven into a play called *One River*, written by theatre professor Tom Isbell and performed by a student cast from the University of Minnesota Duluth (UMD).

The play grew out of “*One River, Many Stories*,” a year-long initiative launched in fall 2015 by UMD



*Scene from production of "One River" at University of Minnesota Duluth.  
Image courtesy of Mueez Ahmad and Brett Groehler.*



journalism professors John Hatcher and Jennifer Moore. The project was an homage to the late journalist Mike Simonson, who had intended to produce an epic radio documentary about the St. Louis River in his retirement. Instead, with his widow's blessing, they invited journalists, poets, artists, and other river lovers to share their own stories about the river. The program recently published their final report available [here](#).

Tom Isbell was drawn immediately to the idea of capturing the essence of the project in an evening of theatre as another way to tell river stories. When he set out to write the script for the play, Isbell's challenge was to sift through millennia of history and hundreds of stories, told by dozens of narrators, both human and nonhuman. The resulting documentary theatre adaptation succeeded by channeling narratives about the river's past, present, and future using short stories, vignettes, and quotations delivered by the 11-member cast. The setting was spare, but evocative. Each scene was performed with minimal props (paddles, beaver hats, lanterns, newspapers) and creative use of movable stage blocks, which transformed into kayaks, river banks, or Duluth street corners.

The river was established as the central character in the play through the opening portrayal of Anishinaabe Water Walker [Sharon Day](#), whose message is, "Water, we love you." Journalist Mike Simonson and his unfulfilled dream project were portrayed with a palpable sense of loss, yet the trajectory of the storyline did not allow the audience to wallow in sadness. Instead, a rowdy all-hands-on-deck "One River Rap" was a musical telling of the project's evolution, as Simonson's colleagues and friends brought it to life.

Other scenes varied from humorous to dramatic, light to raucous. The geologic history of the river was told with actors' bodies illustrating glacial drift and structural geology. "Isn't geology cool!" they announced. Local poet Sheila Packa, Duluth's Poet Laureate, was portrayed through a reading of her river poem. Laura Erickson, the



*Map of Minnesota and the St. Louis River showing the location of Duluth (MN) and Superior (WI), marked in orange. Map after Alexrk2 and GeoTools. (CC BY 3.0)*

"Dr. Ruth of Ornithology," was the embodiment of true bird lovers everywhere. The epic story of the 1871 digging of the Duluth shipping canal was portrayed with comic satire, complete with heroes and villains seeking to outwit each other as to which of the Twin Ports, Duluth or Superior, would be able to create the more accessible harbor. Legend has it that citizens banded together to dig the canal overnight; the audience was left to ponder a more nuanced interpretation of both places.

Animals also told their stories of life on the river. Two beavers narrated (in exaggerated Canadian accents) their love story and mating rituals. Eagles, loons, and songbirds evoked the wild nature of the St. Louis and the fragility of the ecosystem, both past and present. Wendell Barry, A.A. Milne, and other river philosophers and

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writers were represented by short narrations in contemplative moments between scenes.

Actors garbed in plastic rain ponchos and carrying stacks of newspapers called out an hour-by-hour narration of the devastating Northland flood of June 19-20, 2012. Over 24 hours, a record 10 inches of rain had roared down the hills and rivers above Duluth and along the North Shore, washing out sewers, roads, and bridges. “10:39 pm: Manhole covers blowing out on Main Street.” Whap—newspapers hit the floor; actors stomp to next position. “12:52 am: car falls into sinkhole on Skyline Parkway, 4 occupants escape.” Whap! “2:40 A.M. Raging Kingsbury Creek floods Lake Superior Zoo. Polar bear escapes its enclosure! A seal is swimming on Grand Avenue!” Whap! The

scene might have been a tad too long for some, but for those who experienced the 16.6 foot “flood of record,” it was a visceral reminder of the hours of terror and years of rebuilding.

As they explored the intertwined ideas of “story” and “sense of place” throughout *One River*, the players evoked the Department of Natural Resources, the Nature Conservancy, and other agencies and advocacy groups. The characters invited all to enter into the stories and to participate in shaping the narrative. The story would not have been complete without attention to the conflict that grips the region today. Communities throughout the North Country and the region are debating the pros and cons of copper-nickel mining: a promise of renewed mining jobs on the



*Kayaking on the St. Louis. Scene from “One River.”  
Image courtesy of Mueez Ahmad and Brett Groehler.*

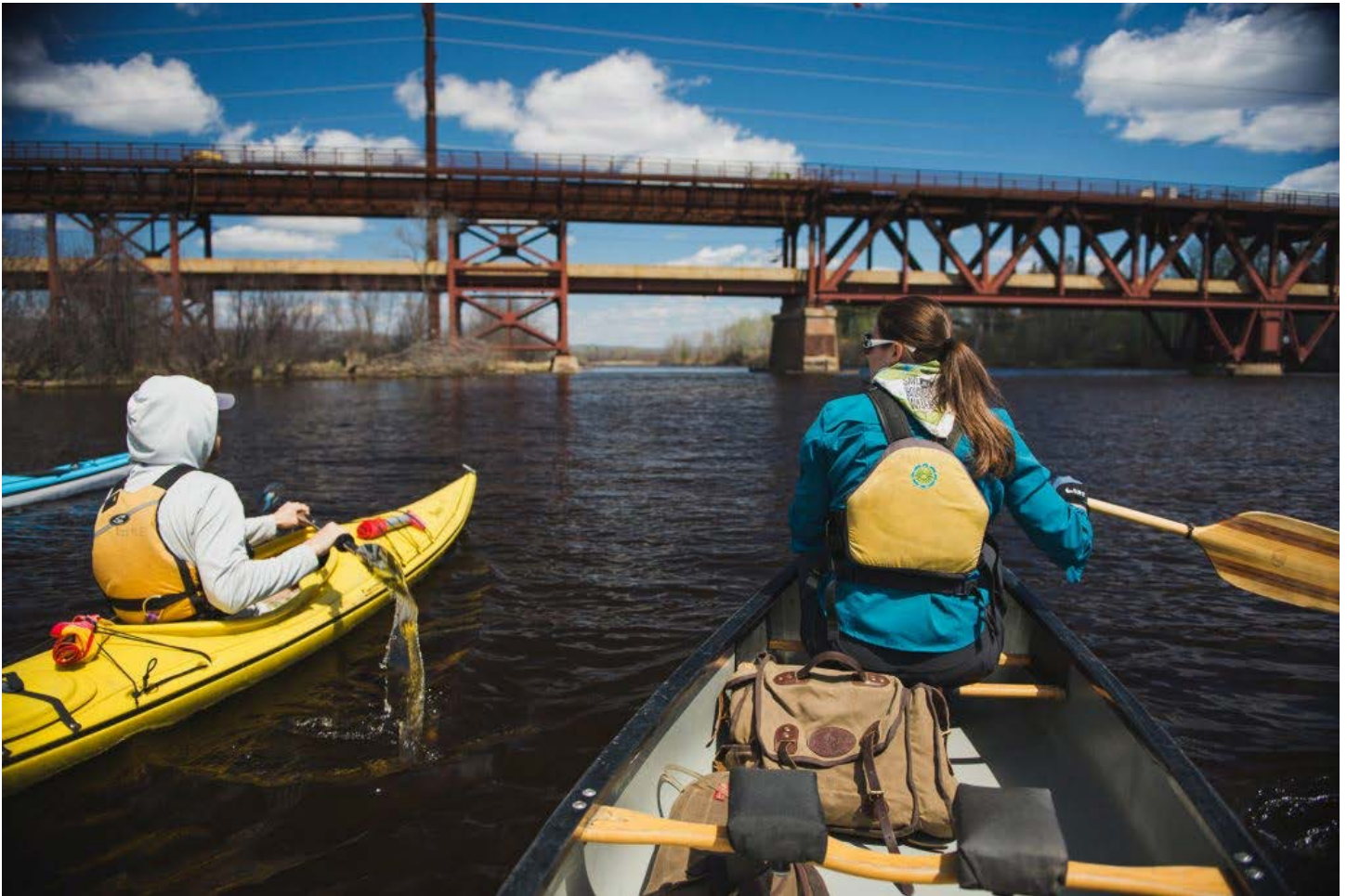
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Iron Range versus the potential for long-term damage to the river and its watershed, as well as Lake Superior. Sara Thomsen's folk song, "Precious Water," hauntingly told one side of the debate, evoking a plea for preservation of the environment and the river. Seeking not to become preachy or one-sided, the cast also presented the perspective of miners and the need for economic development in depressed communities.

What was the takeaway from *One River*? No matter what story was being told, or whose voice was telling it, the overarching message being conveyed was one of appreciation and caring. "St. Louis River, we love you," each player seemed to be saying. It was a local story, locally told.

So when the UMD Theatre Department was invited to perform *One River* at the Kennedy Center American College Theatre Festival Region V Festival in Des Moines, Iowa in January 2017, Director Isbell wondered if the stories so particular to the St. Louis would speak to wider audiences. Apparently they did. The performance received standing ovations at all four performances, and audience members, whether they knew anything about the St. Louis River or not, reported that the play spoke to them, "because they substituted the rivers from their own lives," reported Isbell. "We loved that."

In addition, the Theatre Department received four national awards: Outstanding Production



*Paddlers make their way down the St. Louis River Estuary near the Oliver Bridge, just south of Duluth, MN. Paddlers in the area are currently working to earn the St. Louis River National Water Trail status. Image courtesy of [Alex Messenger Photography](#).*

of a New Work, Outstanding Director of a New Work, Outstanding Ensemble, and Second Place, the David Mark Cohen Playwriting Award. The

awards were presented to Tom Isbell at a national awards ceremony at the Kennedy Center in Washington, D.C. on April 21.

## Recommended Citation

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## About the Author

Phyllis Mauch Messenger is grants consultant for the Institute for Advanced Study and administrative editor for Open Rivers. She has edited, co-edited, or co-authored five books on archaeology and heritage, and is currently editing two volumes of essays on the pedagogy of heritage. She has worked on archaeological projects in Mexico, Honduras, and the U.S. and led study abroad programs to Mexico, Peru, and Southeast Asia.

GEOGRAPHIES

# OBSERVING THE WATER LANDSCAPE IN GERMAN-SPEAKING COUNTRIES

By Kristen Anderson

I am a student at the University of Minnesota studying political science and sustainability. In my liberal arts education, I have had plenty of opportunity and flexibility to take courses in environmental policy, urban planning and design,

and sustainability in theory and in practice. I have grown especially interested in water issues. I care about the Mississippi riverfront in Minneapolis, the effects of agriculture on water quality, and the connections people have to their



*Weir dam and lock on the Rhine River at Breisach, Germany.  
Image courtesy of Kristen Anderson.*

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drinking water, lakes, and rivers. So when I went to Germany to study, I took a good look at how the places I visited treated water as part of the landscape.

I spent 11 months in Europe studying abroad and traveling. Because I only visited a handful

of places, it's impossible to make generalizations about "Europe" overall. There are so many histories, so many languages and dialects, so many different cultures. Here are some things I observed, organized by their scale on the landscape.



*Drinking fountain near Freiburg, Germany. Image courtesy of Kristen Anderson.*

# Drinking Fountains, but Different

Drinking fountains with potable water are often found on city streets. Zurich is especially proud of its clean water and beautiful public fountains.

Whereas in the United States we have drinking fountains inside all schools, businesses, and most public buildings, I don't think I ever saw



*Water fountain and mural in Basel, Switzerland. Image courtesy of Kristen Anderson.*

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an American-style drinking fountain inside of a building there.

Other fountains are incorporated into historic structures, such as this water fountain and mural tucked under an eave in a historic quarter of Basel. A small sign under the spigot indicates in multiple languages that the water is potable. Generally, fountains are assumed to have clear, drinkable water unless labeled otherwise.

In Vienna there is a modern set of drinking fountains. The 12 large stainless steel fountains were

designed for the European Soccer Championships to provide refreshment to fans in crowded public places. They have “Drink Water!” written prominently (in German and English) and feature two spigots and a button-operated mist shower. These movable fountains are now set up in the most popular tourist areas of the city to provide free fresh drinking water.



*One of twelve drinking fountains in Vienna, Austria, designed for the European Soccer Championships. Image courtesy of Kristen Anderson.*



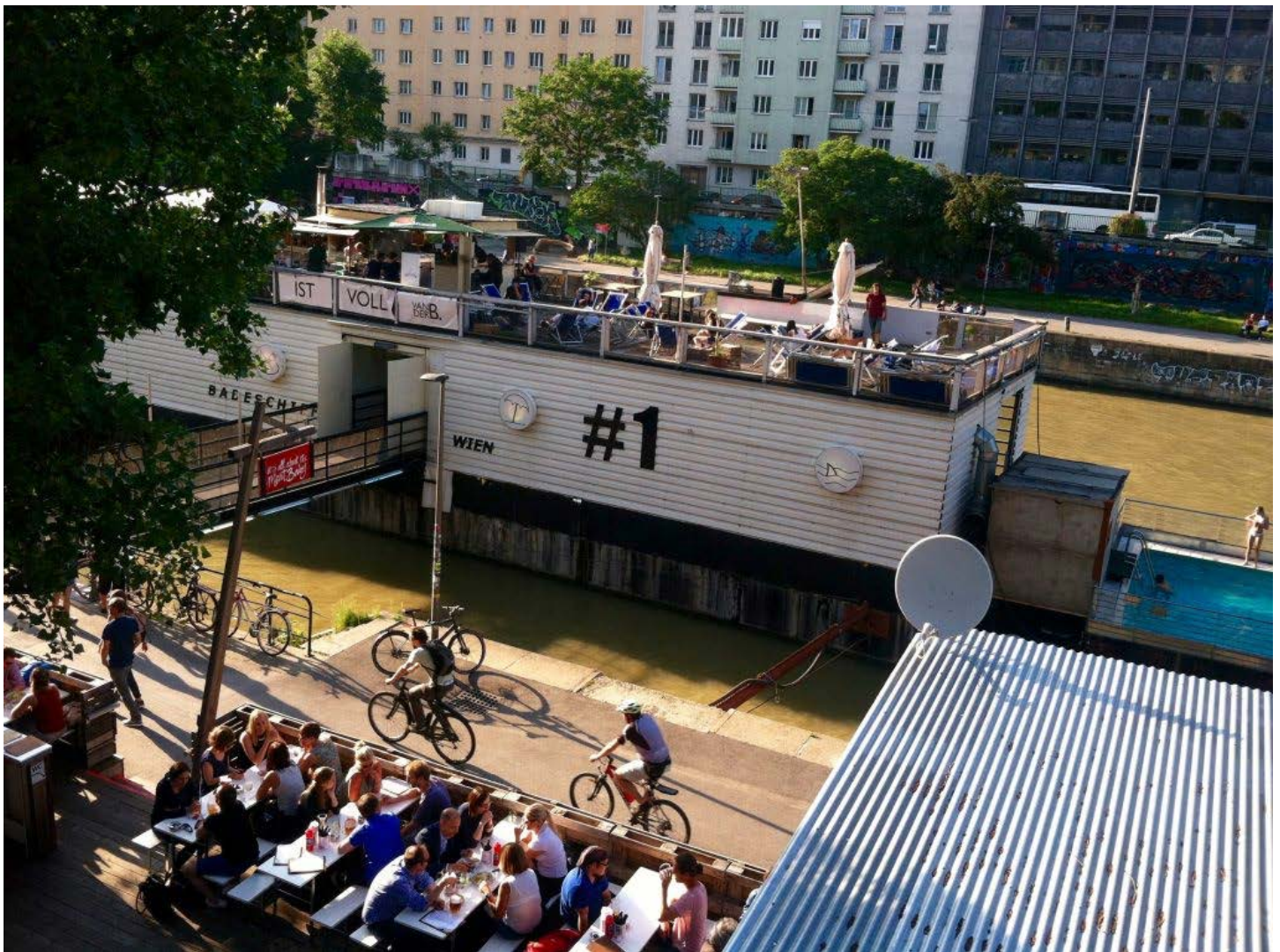


*Viennese drinking fountains feature spigots and a mist shower.  
Image courtesy of Kristen Anderson.*

# Lively Urban Riverfronts

In Europe, many riverfronts seem to have a lot more people on them, engaged in many more types of activities, than in the U.S. There is nothing wrong with biking and jogging and walking, which is what the American riverfront is used for, but population density in Europe is much higher than in the United States. There are more people competing for their share of public space and natural resources, and there have been

for centuries. Because of the higher density and demands on their environment, Europeans must be innovative in how they design, govern, power, and live in cities. American cities sprawl out with new greenfield developments and separate their commercial, residential, industrial, and recreational uses of land. In contrast, European riverfronts are often multi-modal and multi-use.



*Floating restaurant and swimming pool on the Danube Canal in Vienna, Austria.  
Image courtesy of Kristen Anderson.*



*Wading near a streamside cafe in Freiburg, Germany. Image courtesy of Kristen Anderson.*



*Pedestrian paths and bridges along the urban Dreisam River in Freiburg, Germany. Image courtesy of Kristen Anderson.*

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An excellent example of a lively riverfront can be found in Vienna on a summer afternoon. The old Danube Canal flows near the historic downtown, while the actual Danube River flows further away. Along the canal there are walking and biking paths, walls of colorful graffiti, cafes with outdoor seating overlooking the scene, and boarding areas for tourist cruises. A floating restaurant occupies half of a barge and on the other end there is an aqua-blue swimming pool floating above the gray-brown canal water.

On a much smaller riverfront, Freiburg has some great spots alongside the small Dreisam River. Five minutes from the central commercial pedestrian zone is a large arterial street and the Dreisam River. Anyone can descend right to the cold, clear water, and the sounds of traffic almost disappear. Then they can enjoy brunch or a beer

at a streamside cafe, or wander on the walking path which has plenty of benches. When it's hot, the river is an alternative to air-conditioning. There are wonderful wading and swimming spots, and highly used picnic areas. People even set up lawn chairs and grills right in the middle of the stream.

On the other riverbank of the Dreisam, opposite the walking path, there is an express bike route. At the intersections where the bike route meets a road, the bikes have the right of way. This express bike path is part of the city's Bicycling Concept for 2020 because it gives easy access to important neighborhoods, to the city center, and to other attractions like the stadium located along the river. The riverfront bike path extends several dozen miles. High water levels are monitored by public gauges reporting daily streamflow; the



*Picnickers enjoy the Dreisam River and the beginning of the Black Forest in Freiburg, Germany. Image courtesy of Kristen Anderson.*



*Express bike route, pedestrian path, Dreisam River and picnic grounds in Freiburg, Germany.  
Image courtesy of Kristen Anderson.*



*High water levels nearly flood the Dreisam River bike route in Freiburg, Germany.  
Image courtesy of Kristen Anderson.*

trails are closed or rerouted if seasonal flooding of the trails occurs.

Longer-distance river bike tours are fairly common. German-speaking travel companies offer several routes and itineraries for tourists to cycle leisurely along riverfronts by day, explore cultural gems and enjoy dinner in a restaurant, then find

their luggage already delivered to the hotel room. The Danube is a particularly popular destination for this kind of activity. These travel companies also make it easier to tour rivers by offering electric bikes, short daily distances, and transport past rough or difficult areas. In the United States, organized bike tours are much less common.

## Regional Landscape Influenced by Rivers

Between France and southern Germany is the unique Alsace region. The Rhine River has often served as a natural border. But over many

centuries of shifting control, the region also had shifting borders and developed its own language, culture, and river borderland history.



*Tourists and Tanner's House in the Petite France area of Strasbourg, France.  
Image courtesy of Kristen Anderson.*

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Imagine living in Strasbourg, France, but then the Germans claim the city, and then a couple decades later once again being claimed by the French!

Beginning in the nineteenth century, the Rhine River was straightened by military general Johann Gottfried Tulla. The massive engineering

feat was intended to reduce the catastrophic results of natural flooding, but the deepened channel also lowered the groundwater level and changed the floodplain ecosystems.

Additional canalization in the Upper Rhine Valley is seen in the extensive Grand Canal of Alsace. It has several locks and dams and allows



*Students walk past a sign indicating historic flooding levels prior to channelization of the Rhine River in Istein, Germany. Image courtesy of Kristen Anderson.*



*Weir dam and lock on the Rhine River at Breisach, Germany.  
Image courtesy of Kristen Anderson.*



*From the bottom of the image to the top: Rhine Canal, navigation channel,  
hydroelectric plant. Breisach, Germany.  
Photographer Norbert Blau. Used under Creative Commons (CC BY-SA 3.0).*



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for navigation to Basel, Switzerland. This is a very important European inland waterway. The French won exclusive hydropower rights in the 1919 Treaty of Versailles (which brought an end to World War I). Parallel to the hardscaped canal flows a wild channel, which can take on seasonal extra flow diverted from the canal.

The Integrated Rhine Programme proposes floodplain restoration through a series of polder projects to reclaim land via dikes and drainage systems. It was developed by the French and German governments through an agreement signed in 1982 to increase flood protection and riparian wildlife habitat. The polder at Altenheim is a working example. Dikes surround an area of alluvial forest which is flooded when a gate is opened. Then the water slowly drains back out to the main channel of the Rhine River. Downstream communities benefit from mitigated river flow.

Of the proposed projects necessary for full implementation of flood regulation on the Rhine, some have encountered resistance. At a project near Hartheim, for example, local citizens put up a billboard to express their concerns about increased truck traffic through their town. The project involved the removal of thousands of truckloads of gravel which allowed the river to flood into the gravel pit area. Despite the local frustrations, within two years there was successful regrowth of the willow-poplar alluvial forest. Other projects have yet to be completed.



*“Natural” Rhine River channel allowed to flood near Hartheim, Germany.  
Image courtesy of Kristen Anderson.*



Citizen activists oppose a flood management project with this billboard on the proposed site near Hartheim, Germany. Image courtesy of Kristen Anderson.



*Students learn about a successful new flood mitigation forest several miles from another project facing opposition at Hartheim, Germany. Image courtesy of Kristen Anderson.*

# Concluding Thoughts

I saw and experienced these examples of connections to water through the lens of my liberal arts education and my interest in water resources and urban planning. It is impossible to generalize attitudes about water that would take into account a whole continent of people from various cultures, so it would not be fair to say that my observations proved that water was more intentionally cared for by Europeans. However, I do believe that the Germans, Swiss, and Austrians have a certain consciousness about the value of their natural resources. Maybe it is ingrained in their society because of centuries-long interactions with fields and forests, stunning wild Alpine landscapes, and natural water features.

This valuing of resources is evident in Germany's comprehensive recycling programs and in a German company's commitment to developing water-efficient appliances. It makes sense that Germany leads the European Union in organic agriculture standards that protect land and water

and that Austria and Switzerland utilize their mountainous geography and high annual precipitation to generate 60 percent of their energy using responsible hydropower.

As I continue my studies and professional development, I will look at the familiar Minnesota landscapes and waterways a little differently because I have gained a new perspective on how the communities I visited treat water as a valued part of the landscape.

## Recommended Citation

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## About the Author

Kristen Anderson is a senior at the University of Minnesota studying political science. She is interested in sustainable agriculture, community engagement, and environmental advocacy. Her experiences in Minnesota, Germany and beyond have taught her about living responsibly and cultivating meaningful relationships with people and places.

## TEACHING AND PRACTICE

# WHAT WE LEARNED FROM THE RIVER

By Joseph Underhill

What happens when you leave the confines of the classroom, step away from the whiteboards, data projectors, and PowerPoints, and move into the richness of the world itself? In August 2015, a group 17 students, staff, and faculty from Augsburg College loaded four 24-foot voyageur canoes with their gear and started paddling down the Mississippi River as part of the first River Semester. Over the next 110 days they traveled 3,600 miles, 675 of those by canoe, camping out most of those nights while completing a full complement of 16 credits in a wide

range of course topics. The lessons learned from the river were reflected in the journal entries and reflective writing of the students. These covered a range of themes: a sense of adventure and exploration, an appreciation for the river, and an increased sense of agency in relation to the environmental issues on the river.

The basic structure of the college classroom and curriculum entails a controlled space, a set curriculum drawn from a specific academic discipline, an authority structure based on the doctorate,



*Students in the Augsburg River Semester Program at the Headwaters of the Mississippi River, Lake Itasca, South Clearwater, MN. Image courtesy of river\_semester Instagram.*

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and students seated in rows, taking notes. The learning there about the “real world” is filtered through the lens of the professor’s lectures, the scholarly texts, and the demands of intellectual rigor and preparation for the workplace. This is a setting and process increasingly complicated by

sophisticated technology, increasing regulations and guidelines, and more outside demands on higher education.

To be instead on the Mississippi River for over 100 days is a different kind of education (and life)



*On the River Semester Program, the classroom is everywhere. Learners here are enjoying their first guest lecture at Itasca. Image courtesy of river\_semester Instagram*

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experience. The river is such a complex, beautiful, multifaceted, varied, troubled, and yet resilient thing that it overwhelms the knowledge or ability of any academic or faculty to comprehend it in any holistic sense. It inspires wonder, curiosity, and humility. As one student put it, “There is an element to this trip where we never leave class.

It’s amazing to be able to have conversations with people that not only make you question and think about yourself and what you believe, but also think about what you have never thought about before. I have never wanted to learn so much more about everything.” As another put it, “I’ve learned more on this trip than I probably have in



*Sunrise over the Mississippi River at Pool 10. Image courtesy of river\_semester Instagram.*

all my time [in college so far]. For me, that says more about the education I received on the trip than anything else.” Reflecting the appeal and educational value of the experience, a student wrote that “Never in my life have I been so immersed into the subject matter of my [field of study]. I was [studying] what I was living day to day. This immersion allowed me to see the world as it actually is, not through a window or screen.”

In that setting the faculty are no longer the main authority. Instead it is the river that has the final say. Faculty in this setting become guides, facilitators, partners, mentors, and co-learners of all that the river has to teach. As one student on the program put it, “It feels good to say ‘I know the Mississippi.’ But of course you don’t—what you know better is yourself and the Mississippi has helped.” Here the traditional role of the instructor was reversed; the river was the instructor, and we were learning from it. The subject of knowledge was also expanded from learning about the ostensible subject of the course to learning about one’s self. This is the kind of richness and rethinking that these kinds of immersive experiences can provide.

One of the greatest contrasts between the classroom and the river is that one has to let go. The syllabus no longer dictates curriculum or class schedule. This however had great educational value. Leaving the relatively controlled and sterile environment of the classroom, and taking to the field involves learning that is by its nature interdisciplinary and problem-based, and also more participatory and democratic (Wattchow and Brown, 2011). In real-world settings, students can help in planning and customizing their course of study, as dictated by the changing conditions and realities on the ground. The River Semester was guided by critical, place-based, and experiential pedagogy (Breunig, 2005; Farrell, 2010; Orr, 2004; Gruenewald, 2008; Freire, 2000). We based our learning experiences and teaching practices in the lived realities constituted by the participating students and faculty at particular

times and in specific places. This increased the potential for agency, authenticity, and the realization of human potential within those students and in that community (Dewey, 1938; Kolb, 1984; Louv, 2008). Students reported that, “Some of the most memorable opportunities and experiences in life are brought about by wandering from the path.” The river guided our journey and shaped what we experienced and who we met with. “When traveling, talk to people instead of doing the things you are supposed to do. Learn about the culture, and get lost in the places [that] locals go,” one student concluded. As the trip progressed, students became increasingly comfortable with life on the road and with going off the beaten track. The expedition transitioned students into greater leadership roles to the point that by the end of the canoeing portion of the trip, they were able to plan and execute the travel downstream. This came with a sense of gratitude, of acknowledging the benefit to be gained from adversity. One student expressed it this way (quoting writer Richard Bach): “There is no such thing as a problem without a gift for you in its hands. You seek problems because you need their gifts.”

A key element of learning from the river was the simple act of paying attention, of listening. On this theme of “learning to listen,” the students seemed to be developing a kind of awareness, attentiveness, or mindfulness. One student’s research project involved using a hydrophone and digital recorder to capture sounds both underwater and in some of the group’s day-to-day activities. The following passage from the student’s final paper captures nicely the ways in which students on the trip were simultaneously learning about the river and about themselves, both as individuals and as a group:

Looking at the stars or a campfire, listening to my guitar, and talking about ourselves, the world and our place in it, fostered by the lessons taught in our classes is certainly a powerful listening experience. We talked



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about the problems the river and ourselves face, and how we could solve them, and we became a family in the process. Emotional development and well-being are an aspect of this journey that can be overlooked, but we were learning who we are on those beaches

and campsites. I believe self-discovery is an important part of listening as well.

The passage reflects the student's sense of awakening to the challenges and responsibilities of adulthood, the sense of connection to each other as a family, self-awareness, and at the same



*Setting up camp at Pool 5 Weaver Bottoms. Image courtesy of river\_semester Instagram.*

time a sense of worldly competence gained in a community of peers.

This high-impact learning translated into a heightened sense of environmental concern and stewardship or, as one put it, the trip allowed the student “to experience an environmental issue rather than just research it. It is because of the River Semester Program I have a newfound respect and care so much more for experiential learning. It has given me a new perspective on life, made me more environmentally and politically aware, has pushed me out of my comfort zone, and has made me a better person in many ways.”

This aspiration has been borne out by a number of the students in the program who have gone on to plan other off-campus and experiential learning opportunities. One student commented that the group was not just learning about how to live sustainably, but actually “living (extremely) sustainably (compared to the average American)”

and that this had given them “a new perspective on how reasonable it is to live while consuming a fraction of what people think they need. This will resonate with me for life and I hope to change the attitude of others in my life regarding lifestyle practices.” Stated in broad terms, another student wrote that the multidimensional aspects of the learning simply “made me a better person.”

*See video [Augsburg College’s River Semester Week Eleven](#), courtesy of Ricky Taylor.*

Another salient aspect of the trip was the narrative richness of the experience. Twain’s presence is unavoidable on the river, and we found a narrative quality to our encounters all along the way. One of the greatest advantages of traveling the length of the Mississippi River is the wealth of communities, organizations, “river rats,” and “river angels” one inevitably encounters. The program partnered with a number of educational, research, arts, and river-related organizations and had dozens of guest speakers during the



*Mark “River” Peoples Quapaw Canoe Trail Guide during his time as a guide for the Augsburg River Semester. Image courtesy of Ricky Taylor.*

course of the semester. The students came to see themselves as part of a co-created community in which their stories and the stories of others were being woven together. As one student put it, “Every time you talk to someone you become part of their story and they become part of yours.”

Another recalled that, “When you talk to people who have lived on the river or who have been part of the river for their whole lives you learn about so much more than history and science. The river shapes lives.” The students expressed appreciation for the fact that, “Everyone is the



*Paddling on the Mississippi River to Choctow Island.  
Image courtesy of river\_semester Instagram.*

main character in the chronicles of their life and story. With the right level of respect & excitement, no person, town, or people is too small to be significant.”

There was a welcome sense of reciprocity in the communities along the river, with the locals as interested in the students as the students were in them. Students found that they were in demand almost everywhere the group stopped, and engaged in an active exchange of stories and information with folks they met along the way. This led to an observation that, “Oftentimes your adventure and journey are the most valuable things you can offer others.”

With this sense of connection came as well a heightened sense of the basic goodness of human beings—a valuable perspective at this time of fear, alienation, and xenophobia. The trip clearly helped students overcome some of their fears and gave them greater confidence in their ability to meet new people and enter into new situations. As the group met with people and communities along the way and were welcomed so enthusiastically, they had an experience of humanity and of human goodness that is sorely lacking from dominant public narratives. One student wrote, “Generosity is still alive and well, and all it takes to find it is quality time and conversation. Some people just need someone to listen to THEIR story, and in exchange you’ll receive some amazing comforts. Some people will talk to you for hours.”

Perhaps the most salient connection expressed was, not surprisingly, to the river itself. As one student put it, “The river has stolen my head, my heart, my soul. Mud runs through my veins and my heart is filled with boils and eddies. The current pulls my feet downriver. I have become the river and the river has become a part of me.” Another wrote that, “If I had to describe the river with one word before the trip I probably would have said ‘dirty,’ now I would call it, ‘beautiful,’ ‘bountiful,’ or ‘a dancer.’” This conception of the

river stands in sharp contrast to the mainstream view of it as a highly polluted and industrialized space. Another student, reflecting a new sense of the spiritual significance of the river to them, wrote, “The Mississippi River has always been the life force of America, supplying drinking water and goods across the nation. Maybe someday, America can move past the idea that the Mississippi River is just a river and see the river as a living goddess, or Pachamama, because that is what the Mississippi River is to me now.” This kind of deep connection to something like the Mississippi is arguably the first step toward taking action to protect it.

One goal, in relation to the larger environmental and political issues present in the watershed, was to leave students with some sense of the role they could play in relation to those issues (Shellman 2014). Using democratic principles and demonstrating them in practice to students provided them with the experience of what it is to live democratically, as empowered, agentic citizens (Boyte 2015). In addition to meetings with practitioners and activists along the river, lectures, readings, and discussion emphasized the role of human agency. Students learned how individual choices (such as consumption and lifestyle), the work of organizations (like Living Lands & Waters), and federal legislation (like the Clean Water Act) can and do have real impacts on the world around us. One student reported that, “Through reading [Paul Hawken’s] *Blessed Unrest*, I gained a sense of optimism, much like Hawken. Not trying to jump on his train, but the future doesn’t look so . . . bleak and gray as it once did.” This sense of the possibilities for human agency was reflected in another strand of the students’ writing, summed up nicely in the following quote: “[The] Human spirit is incredibly resilient, especially when looking at all of the problems faced by Louisiana, particularly the Lower 9th Ward & Cocodrie” [a community in coastal Louisiana that is sinking into the Gulf of Mexico]. Students learned both about the problems caused by human action, and also the efforts to correct the mistakes of

the past. “Although humans, and the [U.S. Army Corps of Engineers], have really screwed things up, there are efforts to right the sins of humanity against nature, even the most grievous ones.” It was gratifying to read that, even after having seen first-hand the devastation of Katrina and land loss in the Delta, another student could write, “There is always hope in difficult situations.” Summing up these sentiments most succinctly one student wrote, “You can make a change.”

Although there is clearly value to traditional syllabus-based, classroom-based teaching, and to

the traditional wilderness and adventure-based forms of outdoor education, the responses of students to the River Semester indicate that there is great value in this extensive, hybrid, democratic form of experiential learning in a setting where wilderness and modern industrial areas were both salient features of the landscape. The river taught us about ourselves, taught us to care about the world, instilled a sense of wonder and agency, taught us to pay attention and listen, and prepared those students for meaningful lives of bringing their knowledge to bear in service to the world. These are powerful lessons, indeed.

## References

- Boyte, Harry, ed. 2015. *Democracy's College: Public Work, Citizenship, & the Future of Colleges and Universities*. Nashville, TN: Vanderbilt University Press.
- Breunig, Mary. 2005. “Turning Experiential Education and Critical Pedagogy Theory into Praxis.” *Journal of Experiential Education* 28(2): 106-122.
- Dewey, John. 1938. *Experience and Education*. New York, NY: Kappa Delta Pi.
- Farrell, James. 2010. *The Nature of College: How a New Understanding of Campus Life Can Change the World*. Minneapolis, MN: Milkweed Press.
- Freire, Paolo. 2000. *Pedagogy of the Oppressed*. 30th Anniversary Ed. New York, NY: Bloomsbury Academic Press.
- Gruenewald, David. A. 2008. “The Best of Both Worlds: a Critical Pedagogy of Place.” *Environmental Education Research* 14(3): 308-324.
- Kolb, David A. 1984. *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall.
- Louv, Richard. 2008. *Last Child in the Woods: Saving our Children from Nature-deficit Disorder*. Chapel Hill, NC: Algonquin Books.
- Orr, David. 2004. *Earth in Mind: on Education, Environment, and the Human Prospect*. Washington, D.C.: Island Press.
- Shellman, Amy. 2014. “Empowerment and Experiential Education: A State of Knowledge Paper.” *Journal of Experiential Education* 37(1): 18-30.
- Wattchow, Brian & Mike Brown. 2011. *A Pedagogy of Place: Outdoor Education for a Changing World*. Melbourne, Australia: Monash University Publishing.

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## About the Author

Joe Underhill is an associate professor of political science at Augsburg College in Minneapolis, MN, where he serves as Program Director of the Nobel Peace Prize Forum, Environmental Studies, International Relations, and River Semester programs. He is the author of *Death and the Statesman* (Palgrave 2001) and his current research and writing explore democratic practice and sustainability in higher education. The next River Semester will launch in August 2018.

PERSPECTIVES

# COMMUNITY-ENGAGEMENT AND LOSS

By Sara Axtell

In the twenty years I have worked for the University of Minnesota, I have had many opportunities to be involved in partnerships with community organizations. These partnerships can create an incredible space for learning for the faculty, staff, and students who participate. My own partnerships have transformed my work and my sense of who I am in the world. I feel a deep gratitude to the community elders and teachers, particularly my partners at the Cultural Wellness Center in South Minneapolis, who have invested heavily in my development and helped

to shape my understandings of communities and universities.

In my current position at the University, I serve as a Faculty Development Liaison at the Office for Public Engagement. In this role I help to create opportunities for faculty, staff, and students to deepen our capacity to build respectful and authentic partnerships. Typically when we talk about “faculty development,” we focus on the skills, knowledge, and competencies we need to gain. But as we deepen our capacity to collaborate



*Morrill Hall, home to the University of Minnesota's Office for Public Engagement.  
Image via University of Minnesota.*

with communities, we also need to think about what we need to lose.

In my role as a Faculty Development Liaison, I hear stories from both faculty and community members about their experiences of working together. There are stories of conflict, of transformation, of frustrations, and of healing. Many of these stories, especially the painful ones, hold knowledge about what we need to learn and lose in order to work together. In this piece, I share stories of moments I experienced or witnessed and highlight the knowledge that has surfaced from them.

*I was sitting in a meeting with elders and community workers with years of experience talking about creating a youth violence prevention program in the surrounding neighborhood. A person new to the group turned to me and asked, "How do we solve this problem of youth violence?"*

We need to lose our sense of authority.

Many of us in an academic setting have been taught to answer questions, give our opinions,

and share our perspectives. We have learned that our perspectives hold weight. I know when I was a graduate student, and for many of the students I see today, there is a sense of infinite possibility. There is a sense that we can study anything that interests us and that we can solve any problem.

But as we engage more deeply with community elders and knowledge holders, we begin to lose this sense of authority. We see not only the strengths but also the limitations of our own knowledge. This new understanding helps us to see that what we bring is just one piece of a much bigger picture. We learn what questions are ours to answer and when we should defer to others' knowledge. We are on a long road learning to share intellectual authority (Seanhk-Ka & Axtell, 2007).

*I thought I was going to be learning how to come into a community and use the evidence we have to develop interventions to improve community health. But I have heard from community leaders that that is not what they want from me. Now I don't know what my role can be.*

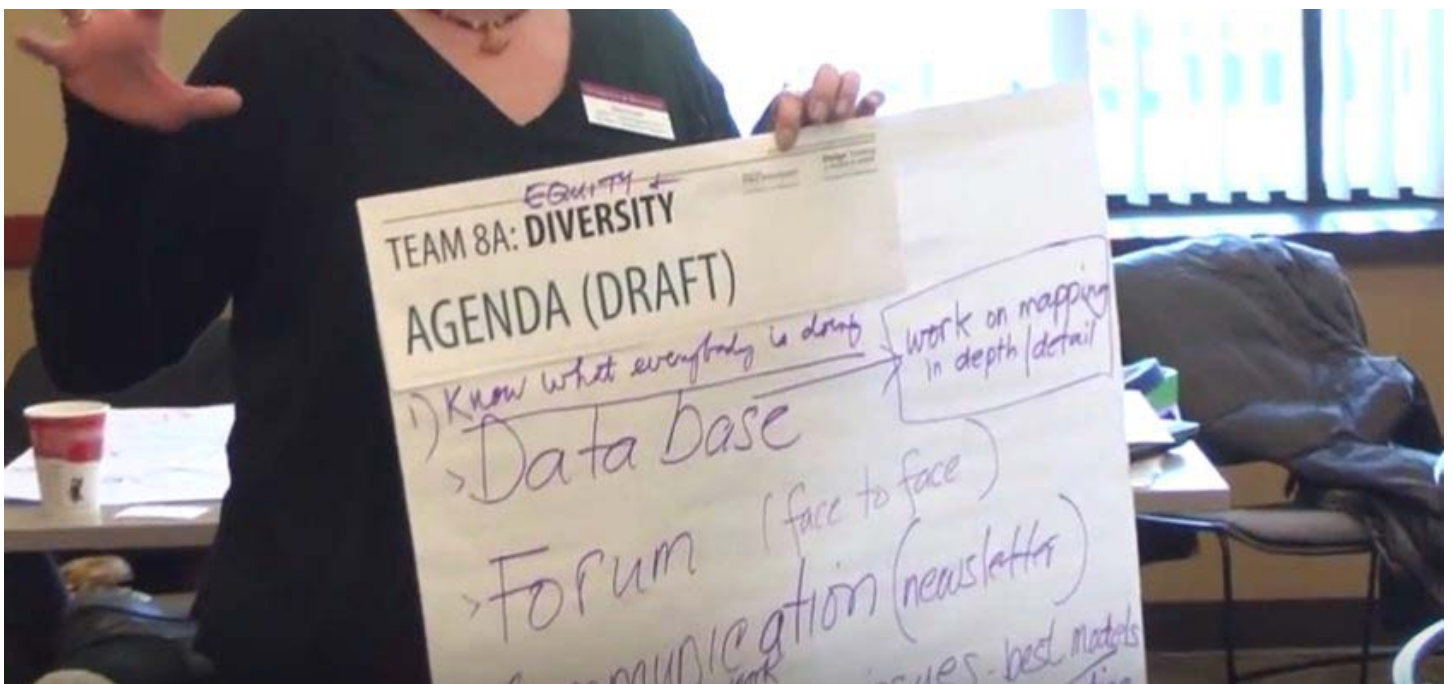


Image courtesy of the University of Minnesota's Office for Public Engagement.



We need to lose our sense of certainty.

When we let go of a sense of authority, we also lose our sense of certainty—our certainty about our role, about what our contribution can be, about what people’s expectations are of us. Instead of trying to quickly resolve these feelings, we have to deepen our capacity for living with ambiguity and uncertainty. We can get better at entering spaces and ways of being that are unfamiliar to us, and better at sitting with uncertainty.

*In a community meeting, a researcher is giving a presentation about her research. A community member asks, “How have you been changed through this process? How has it impacted you as a person, not just as a researcher?”*

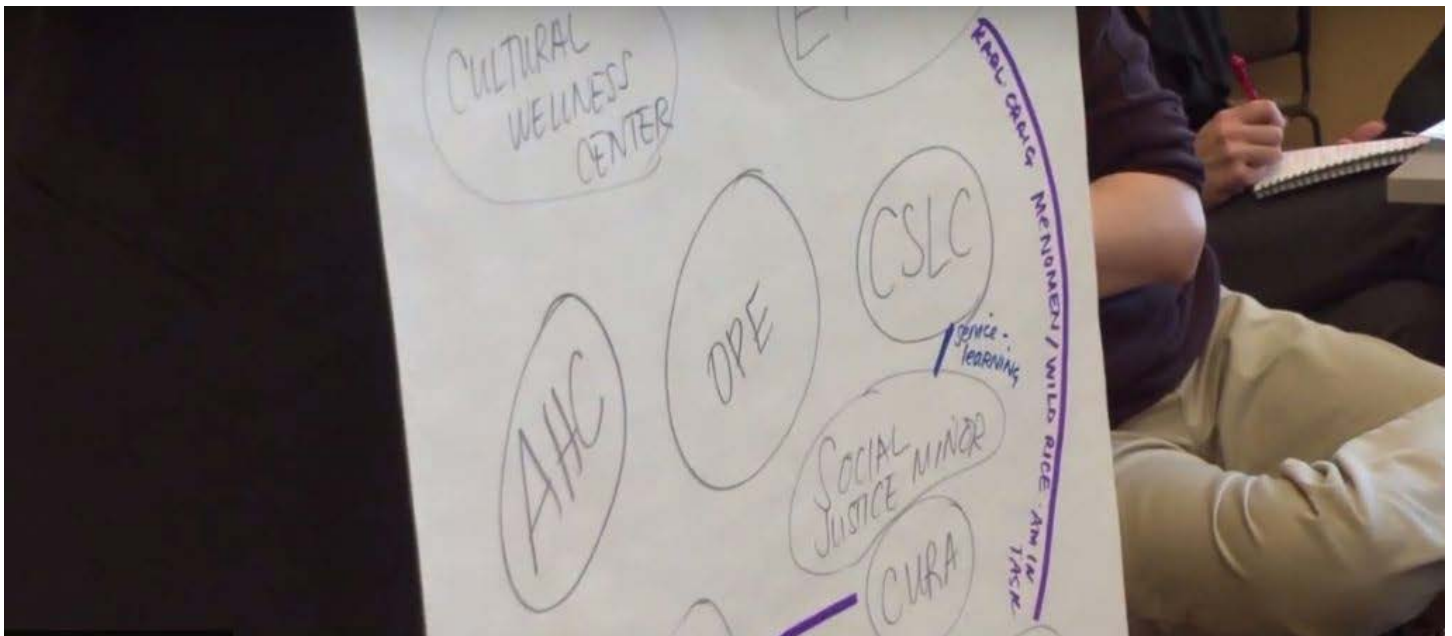
We need to lose the separation we build between our personal and our professional selves.

In many of our professional and academic programs, we are taught to have strong boundaries between the personal and professional parts of our lives. We are taught to be “objective,” which

is seen as both achievable and desirable in many of our disciplines. There is a belief that bringing our personal selves into our work could make us less objective. Even when researchers’ personal stories play a role in our work, we are often cautioned against sharing too much of these personal dimensions.

But as we immerse ourselves in community work, there is an expectation that we will come to the table with our whole, authentic selves and that we are open to being transformed on a deeply personal level. There is an expectation that what we experience will help us to become more fully human.

*A researcher is attending a neighborhood meeting to talk about the possibility of collaborating on a research project. Upon learning that they are from the university, one of the neighbors begins to ask questions about other research projects that had taken place in the neighborhood and to share concerns about how community members never heard anything back about the project findings.*



*Image courtesy of the University of Minnesota’s Office for Public Engagement.*

We need to lose a sense of ourselves simply as individuals.

In western cultures overall, and in American universities specifically, we have a particular understanding of accountability (Healing Roots, n.d.). We see ourselves as accountable for our own actions and perhaps the actions of other university staff we supervise. The idea that others in the community may hold us accountable for the actions of our institution as a whole may come as a shock.

In many of the communities I have had the opportunity to work with, people tell stories of the painful histories of exploitation and suffering that have been experienced as a result of research and of interaction with universities and people in professional roles.

## References

Healing Roots. "European American Culture." Accessed March 28, 2017, <http://healingrootscommunity.com/resourced/history-whiteness-2>.

Seanhk-Ka, Semerit and Sara Axtell. 2007. "Sharing Intellectual Authority." *Partnership Perspectives* 4(1): 78-85.

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As we grapple with community perceptions of us, we begin to see ourselves as accountable not just for ourselves, but for becoming agents of transformation and for helping to change patterns of action that have caused damage in the past and present.

These losses can be painful, but they can also bring healing and growth. They can create the space for deeper, more authentic relationships, the space for different forms of knowledge to come together, and the space to begin to heal the painful histories that separate us.

When we learn what it is we need to lose, the healing becomes more possible.