

A satellite photograph of the Mississippi River delta region. The river is a prominent dark blue-green line winding through a vast, arid, tan-colored landscape. The river's path is highly irregular and meandering, especially in the lower half of the image. The top of the image shows the river's mouth where it meets a larger body of water, likely the Gulf of Mexico, with a darker blue hue. The overall scene is a stark contrast between the lush, water-filled river and the dry, cracked earth.

ISSUE ELEVEN : SUMMER 2018  
OPEN RIVERS :  
RETHINKING WATER, PLACE & COMMUNITY

# PARADOXES OF WATER

<http://openrivers.umn.edu>

An interdisciplinary online journal rethinking the Mississippi  
from multiple perspectives within and beyond the academy.

ISSN 2471-190X

The cover image is of The Nile River, July 19 2004. To the right of the Nile is the Red Sea, with the finger of the Gulf of Suez on the left, and the Gulf of Aqaba on the right. In the upper right corner of the image are Israel and Palestine, left, and Jordan, right. Below Jordan is the northwestern corner of Saudi Arabia. Jacques Descloitres, MODIS Rapid Response Team, NASA/GSFC.

Except where otherwise noted, this work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/). This means each author holds the copyright to her or his work, and grants all users the rights to: share (copy and/or redistribute the material in any medium or format) or adapt (remix, transform, and/or build upon the material) the article, as long as the original author and source is cited, and the use is for noncommercial purposes.

*Open Rivers: Rethinking Water, Place & Community* is produced by the [University of Minnesota Libraries Publishing](https://www.libraries.umn.edu/) and the [University of Minnesota Institute for Advanced Study](https://www.umn.edu/institute-for-advanced-study/).

## Editors

Editor:  
Patrick Nunnally, Institute for Advanced Study,  
University of Minnesota

Administrative Editor:  
Phyllis Mauch Messenger, Institute for Advanced  
Study, University of Minnesota

Assistant Editor:  
Laurie Moberg, Doctoral Candidate,  
Anthropology, University of Minnesota

Media and Production Manager:  
Joanne Richardson, Institute for Advanced Study,  
University of Minnesota

## Contact Us

Open Rivers  
Institute for Advanced Study  
University of Minnesota  
Northrop  
84 Church Street SE  
Minneapolis, MN 55455

Telephone: (612) 626-5054  
Fax: (612) 625-8583  
E-mail: [openrvrs@umn.edu](mailto:openrvrs@umn.edu)  
Web Site: <http://openrivers.umn.edu>

ISSN 2471-190X

## Editorial Board

Jay Bell, Soil, Water, and Climate, University of  
Minnesota

Tom Fisher, Metropolitan Design Center,  
University of Minnesota

Lewis E. Gilbert, Institute on the Environment,  
University of Minnesota

Mark Gorman, Policy Analyst, Washington, D.C.

Jennifer Gunn, History of Medicine, University of  
Minnesota

Katherine Hayes, Anthropology, University of  
Minnesota

Nenette Luarca-Shoaf, Art Institute of Chicago

Charlotte Melin, German, Scandinavian, and  
Dutch, University of Minnesota

David Pellow, Environmental Studies, University  
of California, Santa Barbara

Laura Salvesson, Mill City Museum, Minnesota  
Historical Society

Mona Smith, Dakota transmedia artist; Allies:  
media/art, Healing Place Collaborative

# CONTENTS

## Introductions

Introduction to Issue Eleven By Patrick Nunnally, Editor .....	5
Guest Editor's Introduction to Issue Eleven: The Paradoxes of Peace and Water By Joseph B. Underhill .....	7

## Feature

Learning from the Dakota: Water and Place By Mona Smith .....	14
--	----

## Forum

New Orleans Was Once Above Sea Level By Richard Campanella .....	19
Water as a Source of Regional Cooperation in the Middle East: The Work of EcoPeace Middle East in Jordan, Israel, and Palestine By Giulia Giordano .....	24
Water, Conflict, and Peace By Peter Gleick .....	33
Meandering and Riversphere: The Potential of Paradox By Irene J. Klaver .....	45
The Sources of the Nile and Paradoxes of Religious Waters By Terje Oestigaard .....	66

## Feature

Writing the River By Leslie Thomas .....	86
---	----

## Primary Sources

Paradoxes of Water: A Reading List By The Editors of <i>Open Rivers</i> .....	110
--	-----

## Perspectives

An Endangered River: The Mississippi River Gorge By Olivia Dorothy .....	119
---	-----

**Teaching and Practice**

Paradise Lost: The Struggle to Preserve the Pongola River and its Inhabitants  
By Shira Lanyi ..... 126

**Geographies**

Water Unifies Us All  
By Kristi Achor Pursell ..... 142

**In Review**

A Tour of the Mississippi River Visitor Center  
By Joanne Richardson ..... 149

## INTRODUCTION

# INTRODUCTION TO ISSUE ELEVEN

By Patrick Nunnally, Editor

**W**hen I heard about the Nobel Peace Prize Forum's 2018 focus on "The Paradox of Water," I hoped for a connection between our journal and the perspectives that speakers would bring to the gathering. Here, thanks to a great deal of hard work by many people, not least Augsburg political scientist Joseph B. Underhill,

is the result: a collection of features and columns that explores some of the many paradoxes of water.

Underhill is the director of the Peace Prize Forum and guest editor of this issue (his guest editor's introduction follows my brief comments). His



*The Nile River, July 19 2004. To the right of the Nile is the Red Sea, with the finger of the Gulf of Suez on the left, and the Gulf of Aqaba on the right. In the upper right corner of the image are Israel and Palestine, left, and Jordan, right. Below Jordan is the northwestern corner of Saudi Arabia. Jacques Descloitres, MODIS Rapid Response Team, NASA/GSFC.*

international network of scholars, and persistence in engaging them, has brought voices to our virtual pages that we would not otherwise have been able to reach: Terje Oestigaard on the importance of the Nile in global religious traditions; Peter Gleick on the associations of water and conflict; and Giulia Giordano in how discourses over water might be a strong hope for peace in the Middle East. Underhill discusses others more fully in his guest editor's introduction. Note that articles contributed by Peace Prize Forum participants have a "Forum" designation in this issue.

The Open Rivers team thinks of this issue as a resource for people attending the Forum, as well as a starting point for considerations that will go far beyond the actual gathering in September. A contribution to the dialogue is the feature by Mona Smith, which offers a number of powerful video pieces that explore some of the meanings of water to Dakota people, the people indigenous to this place. We also include reflections from more recent newcomers to this land, captured eloquently by Leslie Thomas' discussion of how a local advocacy group is using words and images

to deepen relationships with the Mississippi River.

Some of our usual columns maintain the international flavor of the issue as a whole, such as Shira Lanyi's reflections on the Pongola River in South Africa. Others have a more local focus: Olivia Dorothy's reminder that the Mississippi River Gorge is subject to important discussions on its future and Kristi Pursell's discussion of the nearby Cannon River Watershed Partners. We also have a review of the local National Park Service visitor center in St. Paul, which reminds us, as if we need it, that eight-year-old boys and their mothers look at things very differently!

For those who want more on the various and broad-ranging subjects here, the Primary Sources column offers a bibliography for further reading, compiled by the *Open Rivers* team.

Happy reading, everyone!

PS: If you are new to the journal, and would like to be put on the list to get notices of upcoming issues, send us a note at [openrvrs@umn.edu](mailto:openrvrs@umn.edu).

## Recommended Citation

Nunnally, Patrick. 2018. "Introduction to Issue 11." *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/introduction-to-issue-eleven/>.

## About the Author

Patrick Nunnally coordinates the River Life Program in the Institute for Advanced Study at the University of Minnesota. He serves as editor for *Open Rivers* and was one of the lead scholars for the University's John E. Sawyer Seminar, "Making the Mississippi: Formulating New Water Narratives for the 21st Century and Beyond," funded by the Andrew W. Mellon Foundation.

INTRODUCTION

# GUEST EDITOR'S INTRODUCTION TO ISSUE ELEVEN: THE PARADOXES OF PEACE AND WATER

By Joseph B. Underhill

This issue of Open Rivers, anticipating and drawing on the upcoming Nobel Peace Prize Forum in Minneapolis, explores the complex intertwining and paradoxes of water, conflict, and peace. Anything so fundamental and complex

as water or peace must, of necessity, contain seemingly contradictory or opposite qualities. The beauty of water is in how it reconciles and provides space for those complex, muddy mixes of qualities and characteristics. The contributors



*The mixing of the clear and turbid, rural and urban at the confluence of the St. Croix and Mississippi Rivers (detail). Image courtesy of Minnesota Pollution Control Agency (CC BY-NC 2.0).*

## ISSUE ELEVEN : SUMMER 2018

to this volume help us to see the manifold ways in which water, particularly in rivers, is a source of both peace and conflict, life and death, connection and separation, purity and filth, the sacred and profane. At a time when the human impulse to simplify and isolate from these complexities of the world is so apparent, these voices call us to recognize and live into what it means to exist on a planet soaked in water, and as such, a world saturated with paradox.

The Nobel Peace Prize Forum, taking place at [Augsburg University](#) on September 13-15, 2018, will include, among many others, the authors of the five forum articles in this volume. Each explores different dimensions of the complex relationships between humans and water. Water, as the great solvent, carries with it our collective

waste, and in washing away our sins, then tells the tale of them. To know how we are doing, we need look no further than the waters around us. Clear waters reflect attentiveness and mindfulness. Polluted waters tell the tale of late industrial capitalism and the collective impacts of what is being called the Anthropocene—stolen lands, removed populations, topsoil erosion, contaminants, PFCs, and eutrophication. In this great rinse and mix of stories, we find room for both hopefulness and grave concern. Today we swim and drink and fish from the river, yet at its mouth in the Gulf lies the hypoxic dead zone, so rich in nutrients that it chokes out all marine life from an area that grows to the size of Connecticut. At the same time (but for different reasons), the Louisiana Delta itself dissolves into the Gulf at a rate of about an acre every two hours.



*The mixing of the clear and turbid, rural and urban at the confluence of the St. Croix and Mississippi Rivers (detail). Image courtesy of Minnesota Pollution Control Agency (CC BY-NC 2.0).*



As Irene Klaver recounts in her essay, the early Greeks extensively explored these paradoxes of change and constancy; we see variants of these paradoxes in so many aspects of water in our lives today. Economists point to the water-diamond paradox that, despite water's value, we pay so little for this vital substance. Water is both something wild and civilized, a force that we try to control, yet one that is continually slipping

through our fingers. It is at the same time global and local, universal and particular. There is both the great joy of being in water (the "oceanic feeling of oneness") and the terror of the deep. It is a source of great pleasure, but also of "water torture" and waterboarding. Too much and we drown; too little and we die of thirst. We use it constantly, but instead of being "used up," it is endlessly recycled.

## Holy Water

Given these complex and contradictory qualities of water, it is no surprise then that it is both sacred and profane. From the beginning, humans have gone to the watering hole to dip their cup and drink. We have planted seeds and raised animals and gathered around the table for the communal meal. Terje Oestigaard, in his rich account of the religious significance of water, reminds us of the multiple ways that religious traditions have conceptualized water: as purifier and purified (consecrated); as punishment (flood) and blessing (nourishing rain); as the body of the goddess, a divinity itself with the ability to purify, even as it is contaminated with the untreated

sewage of millions of people (as in the case of the Ganges). Oestigaard's essay, drawing on his fieldwork in Ethiopia and Uganda, delves into the complex theology of water at the headwaters of the Blue and White Nile. The source of the White Nile is seen as flowing directly from heaven—the holiest of waters. In contrast, the Blue Nile is conceived by the local community as not having special religious significance, while the waterfalls and cataracts there are seen as powerful spirits, in need of appeasing, sometimes with blood sacrifice.

## Thirsty People on a Watery Planet

Reflecting this theological notion of water as both a divine gift and divine punishment, water is both abundant and scarce. The figure is often cited that only 1 percent of the earth's water is readily available for human use. But the flip side of that equation is that we get by with using only a fraction of that 1 percent, and that there is still 99 percent of the world's water available as a reserve. Each year, humans use about 5 cubic kilometers of water; but each year, the earth receives from the heavens 500,000 cubic kilometers of distilled water in the form of rain. The earth's surface receives in one hour more solar

energy than is used by humans in an entire year. In this aggregate sense, our cup runneth over. As with most resource issues, it is a matter not of the total supply, but how access to those resources is distributed and controlled. The global economy produces a superabundance of food and material goods, while over a billion people still live in the absolute poverty of less than \$1.25 a day. In the Jordan River Valley, Darfur, or the Aral Basin, water demand far exceeds supply, while wealthy countries and communities enjoy virtually unlimited access to clean water. To meet the UN's Sustainable Development Goal 6 (Access to Clean

## ISSUE ELEVEN : SUMMER 2018

Water and Sanitation) will require providing almost a billion people with clean drinking water, and over 2 billion people with access to sanitation by the year 2030.

This contrast between plenty and water scarcity is being exacerbated by climate change. Al Gore, in his 2007 Nobel Peace Prize lecture, characterized it as “a planetary emergency – a threat to the survival of our civilization.” The Intergovernmental Panel on Climate Change (IPCC), likewise noted the “the link between climate and security” has “raised the threat of dramatic population migration, conflict, and war over water and

other resources as well as a realignment of power among nations . . . the possibility of rising tensions between rich and poor nations, health problems caused particularly by water shortages, and crop failures as well as concerns over nuclear proliferation.” In this issue, noted water scientist Peter Gleick provides us with an update and report on the many water management challenges we face in the twenty-first century and the very real dangers of water conflicts, as well as the ways in which we can mitigate these threats and reduce the chances of water being a trigger, or weapon, of war.



*The mixing of the clear and turbid, rural and urban at the confluence of the St. Croix and Mississippi Rivers (detail). Image courtesy of Minnesota Pollution Control Agency (CC BY-NC 2.0).*

# Waters of War and Peace

The research clearly shows that water, as often as not, is the foundation for the diplomatic and negotiated settlement of disputes. The roots of the modern nation-state system are often traced back to the Treaty of Westphalia that ended the Thirty Years War in 1648. It is here that international relations scholars trace the problem of anarchy and the bloody dynamics of geopolitics in the Modern Age. Westphalia established clear lines between sovereign nation-states, but that story, as the Norwegian water historian Terje Tvedt points out, is also one of cooperation and recognition of the complex interconnectedness of communities in seventeenth-century Europe. The negotiations included extensive discussion and agreement on the joint management of shared waterways, particularly the Rhine River. So the Westphalian system is one in which the paradoxical coexistence of war and peace can be seen as two sides of the same coin. Giulia Giordano's article in this issue shows how water diplomacy, facilitated by a range of regional stakeholders such as Ecopeace, has provided one of the few promising areas for constructive dialogue between Palestine, Israel, and Jordan. These cooperative ventures are rooted in the fundamental need of everyone in the region to have adequate access to clean water and provide one of the few rays of hope in that otherwise deeply troubled region.

In seeking these pools of hope, the paradoxes of water call us to draw on the Greek notion of *metis*, a kind of artful cleverness, in addressing these political and environmental challenges of our day. In the face of these complexities, we must avoid the problem of over-engineering, or what John McPhee has called "the control of nature." McPhee, in his discussions of lava flows, the Mississippi Delta, and mud slides, points to this basic problem of the inevitable need for humans to attempt to control nature, in the face of our ultimate inability to do so. Living with paradox requires of us the difficult give and take that stands in contrast to the U.S. Army Corps of Engineers' mandate to maintain the flow of the Mississippi River at Old River Control at the precise and Congressionally mandated balance of 30 percent flowing down the Atchafalaya and 70 percent down the main stem. Historian Richard Campanella recounts these problems of over-engineering in the quintessentially paradoxical city of New Orleans, half of which is below sea level. New Orleans remains an illogical and magical place, its residents engaged in a defiant and dream-like suspension of disbelief in the face of this engineered vulnerability. And there are great lessons to be learned, both from the problems caused by over-engineering, and in the exercise of *metis* and hopefulness, by the residents of New Orleans.

## Swimming in It

The answer to many of these "problems of Modernity," we are learning in our meandering way, lies in letting in more water, more mud, more wetlands. In trying to "stay dry," the city engineers have made the Crescent City, particularly the lower-income and lower-lying neighborhoods,

vulnerable to the kind of inundation and destruction experienced during Hurricane Katrina. Paradoxically, to keep the city from drowning, it must let in more water. Irene Klaver invites us to embrace this "fluid" and meandering frame of mind and draw on the wisdom of the river's

## ISSUE ELEVEN : SUMMER 2018

slow, steady, circuitous traverse of a landscape. To move toward justice, peace, and sustainability will require a fuller and deeper understanding of how water works and flows. The multifaceted cultural understandings of water in our lives, and a balanced way of living with water call us not to be subjugating or conquering rivers, but dancing with them. We fight each other, we fight nature, we fight water, we fight rivers, trying to tame them and bend them to our will to suit narrowly defined human interests. And in the process, our societies and cities are made more precarious and less sustainable.

The Kenyan environmental and human rights activist Wangari Maathai concluded her 2004 Nobel lecture by reflecting on her childhood experience:

I would visit a stream next to our home to fetch water for my mother. I would drink water straight from the stream. Playing among the arrowroot leaves I tried in vain to pick up the strands of frogs' eggs, believing they were beads. But every time I put my little fingers under them they would break. Later, I saw thousands of tadpoles: black, energetic and wriggling through the clear water against the background of the brown earth. This is the world I inherited from my parents. Today, over 50 years later, the stream has dried up, women walk long distances for water, which is not always clean, and children will never know what they have lost. The challenge is to restore the home of the tadpoles and give back to our children a world of beauty and wonder.



*The mixing of the clear and turbid, rural and urban at the confluence of the St. Croix and Mississippi Rivers. Image courtesy of Minnesota Pollution Control Agency (CC BY-NC 2.0).*

Rivers, as I have learned in taking students out on them for many years now, are patient teachers. They flow endlessly, tirelessly, efficiently, the perfectly complex manifestation of the combination of water, topography, and gravity. The peace that “flows like a mighty river” lies not in the stark divide between black and white, but in the countless shades of brown and tan and grey. It is to be found neither on dry land, nor in the deep blue sea, but in the messiness of mud and wetlands, in the semi-permeability of the letting in of some things and the keeping out of others. Peace is in the both-and, not the either/or. As the authors in this issue show us, to be at peace is neither to surrender nor to try to walk on water; it is to be in the agonistic space between

selfishness and selflessness, to be in the water but afloat, to be both carried by the current but also steering the boat, in the ongoing dance between agency and contingency. In the images of the confluence of the Mississippi and St. Croix Rivers at Prescott, Wisconsin, we see this muddying of the waters. Human development, wilderness of a sort, run-off from the farmlands of the Minnesota River watershed, rail and road infrastructure, all combine to create the turbid and fecund mix of human and natural, primeval and modern that constitutes the waters we must navigate, with metis and a thorough embrace of paradox, if we are to create more just, sustainable, and peaceful communities.

## Recommended Citation

Underhill, Joseph B. 2018. “Guest Editor’s Introduction to Issue Eleven: The Paradoxes of Peace and Water.” *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/guest-editors-introduction-to-issue-eleven/>.

## About the Author

Joseph B. 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.

FEATURE

# LEARNING FROM THE DAKOTA: WATER AND PLACE

By Mona Smith

These videos and audios are from [Bdote Memory Map](#). The deep mapping project created by Allies: media/art is a partnership project with the Minnesota Humanities Center. The website was created several years ago to help citizens of the area now called Minnesota know where they are, and to learn **from** the Dakota that this place and the river is not a resource, but rather a relative.

The memory map is a multi-media collection of information and expressions from Dakota points of view, provided by generous people who agreed to be recorded. From a planetarium program director, a retired professor, to spiritual leaders, to leaders in education, to young Ojibwe and Dakota people, each person offers a gift from cultures who have the longest relationships to this place.



*Beach and beaver tree at Bdote. Photographer Lorie Shaull (CC BY-SA 2.0).*

# Jim Rock and We Are Water MN

Minnesota is the homeland of Dakota people. Jim Rock offers insights on Dakota people and the star knowledge that connects people, place, and the universe.

*Listen to [Jim Rock and We Are Water MN here.](#)*

# Chris MatoNunpa on Mnisota Makoce

Much of the land now known as “Minnesota,” particularly the area around the junction of the Minnesota and Mississippi Rivers, is “Mni Sota Makoce,” the homeland of the Dakota people. Chris Mato Nunpa describes the term and translations of it.

*See [Chris MatoNunpa on Mnisota Makoce here.](#)*



# Minnehaha Falls

“We honor water, it is sacred to us...the water is powerful.”

Chris Leith (1935-2011), spiritual leader of the Dakota from Prairie Island Community, speaks of water as the most powerful medicine.

*See [Minnehaha Falls here.](#)*



## Know Where You Are – Bdote

In this 17-minute video, Ramona Kitto Stately and Ethan Neerdaels guide viewers on a tour of several Dakota sites in the Twin Cities. In the Dakota language, “bdote” is a word for the confluence of two bodies of water. To Dakota people, the most important bdote is the joining of the Mississippi and Minnesota Rivers—a place of genesis for the Dakota people. This tour is hosted by the [Minnesota Humanities Center](#).



See [Know Where You Are – Bdote](#) here.

## Healing Place

“That’s where it starts, to know how you are connected, or disconnected, from this place.” On the relationship between healing and place, from the [Healing Place Collaborative](#).

See [Healing Place](#) here.



## Wakan Tipi, Ojibwe Youth is Moved

“The trip there made it seem like I was riding home.”

See [Wakan Tipi, Ojibwe Youth is Moved](#) here.





# Wičáŋhpi Iyótaŋ Wiŋ on the Minnesota River

“The (Minnesota River) valley stretches east to west, so it’s always lit up with sunlight.”

See [\*Wičáŋhpi Iyótaŋ Wiŋ on the Minnesota River\*](#) here.



## We Are Home

“In an urban area, what it means to be a Dakota person...this belongs to us too...we are home.”

See [\*We Are Home\*](#) here.



# Ramona Stately on Wita Tanka/Pike Island

Educator Ramona Stately recounts an elder's words that the earth knows our footprints.

*See [Ramona Stately on Wita Tanka/Pike Island](#) here.*



# Alameda Rocha on the Mississippi River

Words and reflections from Alameda Rocha, at a multimedia art exhibition celebrating the Mississippi River and the continued presence of Dakota people in the modern Twin Cities metropolitan area.

*[Listen to Alameda Rocha on the Mississippi River](#) here.*

*All media with permission from the Minnesota Humanities Center and Mona M. Smith of Allies: media/art.*

## Recommended Citation

Smith, Mona. 2018. "Learning from the Dakota: Water and Place." *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/learning-from-the-dakota-water-and-place/>.

## About the Author

Mona Smith is a Sisseton-Wahpeton Dakota multimedia artist, educator, owner of Allies:media/art, and artist lead for the Healing Place Collaborative. She is creator of the Bdote Memory Map (in partnership with the Minnesota Humanities Center), Cloudy Waters: Dakota Reflections on the River (exhibited at the Minnesota History Center and elsewhere), and other multimedia installations.

FORUM

# NEW ORLEANS WAS ONCE ABOVE SEA LEVEL

By Richard Campanella



*Early one September morning in 1975, in a quiet Metairie subdivision west of Transcontinental Drive, a ranch house suddenly exploded in a fireball so powerful it damaged 20 neighboring buildings and broke windows a mile away. The house plus four adjacent homes were reduced to rubble, and 11 people were seriously injured.*

## *Note from the Editor*

*New Orleans geographer and professor Richard Campanella is an astute observer of the land/water nexus of that deltaic city, which today straddles the level of the sea and is thus highly vulnerable to climate change and rising seas. Campanella is speaking at the September 2018 “Paradoxes of Peace and Water” forum at Augsburg University, and has graciously given us permission to reprint the following article. The piece included below captures all of the peril,*

*complexity, and paradox of water and land management in New Orleans.*

*This article was originally published in the author’s ‘Cityscapes’ column in [NOLA.com](http://NOLA.com)/The New Orleans Times-Picayune, February 19, 2015, and is reproduced here with permission.*

*—Patrick Nunnally, Editor*

## **New Orleans was once above sea level, but a century of storm-water drainage has caused the metro area to sink—with deadly consequences.**

**I**t had happened before, and it would happen again. At least eight times between 1972 and 1977, well-maintained homes in modern subdivisions, all within a mile of each other, exploded without warning. “Scores of Metairie residents,” reported the Times-Picayune, “[wonder] whether they are living in what amounts to time bombs.” Unnerved, Jefferson Parish authorities and Louisiana Gas Service Co. technicians investigated the smoldering ruins and determined the proximate cause to be a broken gas line.

But the number and density of the explosions suggested an underlying cause, one that went beyond shoddy workmanship or tragic happenstance. The culprit, it turned out, was soil subsidence.

Buried gas lines had twisted as Metairie’s recently drained former swampland settled unevenly, causing concrete slab foundations to tilt and buckle. In extreme cases, the lines ruptured, and leaked gas accumulated in cavities beneath the slab or wafted up into attics. All that was needed to ignite an inferno was an electrical spark or cigarette lighter.

Amid a flurry of finger-pointing and lawsuits, parish officials eventually required slab foundations to be set upon a grid of pilings driven into sturdier, deeper earth, below the superficial level most prone to sinkage, and to require “goose neck” hook-ups designed to bend with shifting.

The pilings stabilized the foundations, and the flexible connections put an end to the gas line fissures.

But gardens, driveways and streets continued to sink, particularly in this central-western section of Metairie, which had an especially thick layer of subterranean peat—ancient marsh grass, swamp tree leaves and stumps integrated into the mud like coffee grounds, material prone to severe consolidation when dried. At least one researcher contended it was not broken gas lines but the rotting of this organic matter, following the removal of water and the introduction of air pockets (oxidation), that produced the deadly gas.

Exploding houses represent an extreme example of how soil subsidence can be a public health hazard, and we should be thankful that modern

building codes effectively solved this frightening symptom. But the larger problem remains, and it represents a geophysical hazard shared by all areas, to greater and lesser extents, within the levee-protected, artificially drained metropolis south of Lake Pontchartrain.

Understanding how soil subsidence happened and why it is dangerous entails an understanding of our local geology.

Formed almost entirely by a channel-jumping, seasonally overtopping Mississippi River over 5,000 to 7,200 years, our underlying land comprises five components: sand, silt and clay particles; water; and organic matter.

The river and its distributaries deposited the largest quantities of the coarsest sediments (sand and silt) immediately, making the areas closest to its channels the highest, while dispersing smaller quantities of finer sediments (finer silts and clay particles) farther back, making the backswamp and marshes lower in elevation.

All of the metro area was above sea level, albeit barely in some spots. The lowest areas—today’s Metairie, Lakeview, Gentilly, Broadmoor, New Orleans East and the fringes of the West Bank—accumulated the most runoff and thus preserved the most organic matter in their waterlogged soils. When that ground water was lowered (through manmade drainage systems) and the organic matter dried out, the soil shrunk.

Subsidence first started to occur naturally when the river no longer spread new dosages of fresh water and sediment onto its deltaic landscape. In prehistoric times, this would occur when the Mississippi jumped channels, leaving the old deltaic “lobe” to subside while building a new one elsewhere.

From the 1700s to the 1900s, residents erected artificial levees along the lower Mississippi to prevent springtime flooding. Those historical

deluges, of course, represented disasters for humans, but they were naturally beneficial, and without them, the soils gradually settled.

The vast majority of our modern soil subsidence, however, is attributable not to the river levees but to the installation of drainage systems within metro New Orleans.

Starting in the 1890s, New Orleans developed a sophisticated system to direct runoff through gutters and underground pipes to a series of pumping stations, which would push the water through “outfall canals” and into surrounding water bodies, principally Lake Pontchartrain. Engineer Albert Baldwin Wood made the new system that much more efficient when he developed his patented Wood “screw pumps,” which dramatically increased outflow speed and capacity while removing debris.

The basic design, with key modifications such as pumping station locations, was extended into eastern New Orleans in the 1910s and 1920s and replicated in adjacent parishes in subsequent decades.

The effect of municipal drainage on urban geography was nothing short of revolutionary. Wrote George Washington Cable in 1909, “there is a salubrity that could not be when the...level of supersaturation in the soil was but two and half feet from the surface, where now it is ten feet or more.... The curtains of swamp forest are totally gone[,] drained dry and covered with miles of gardened homes.”

New Orleanians moved en masse off their historic high ground by the river and into new auto-friendly subdivisions on former swamps to the north, west and east. We no longer had to worry about topography.

There was one big problem. In removing unwanted swamp water, air pockets opened in the soil body, which oxidized the organic matter, which

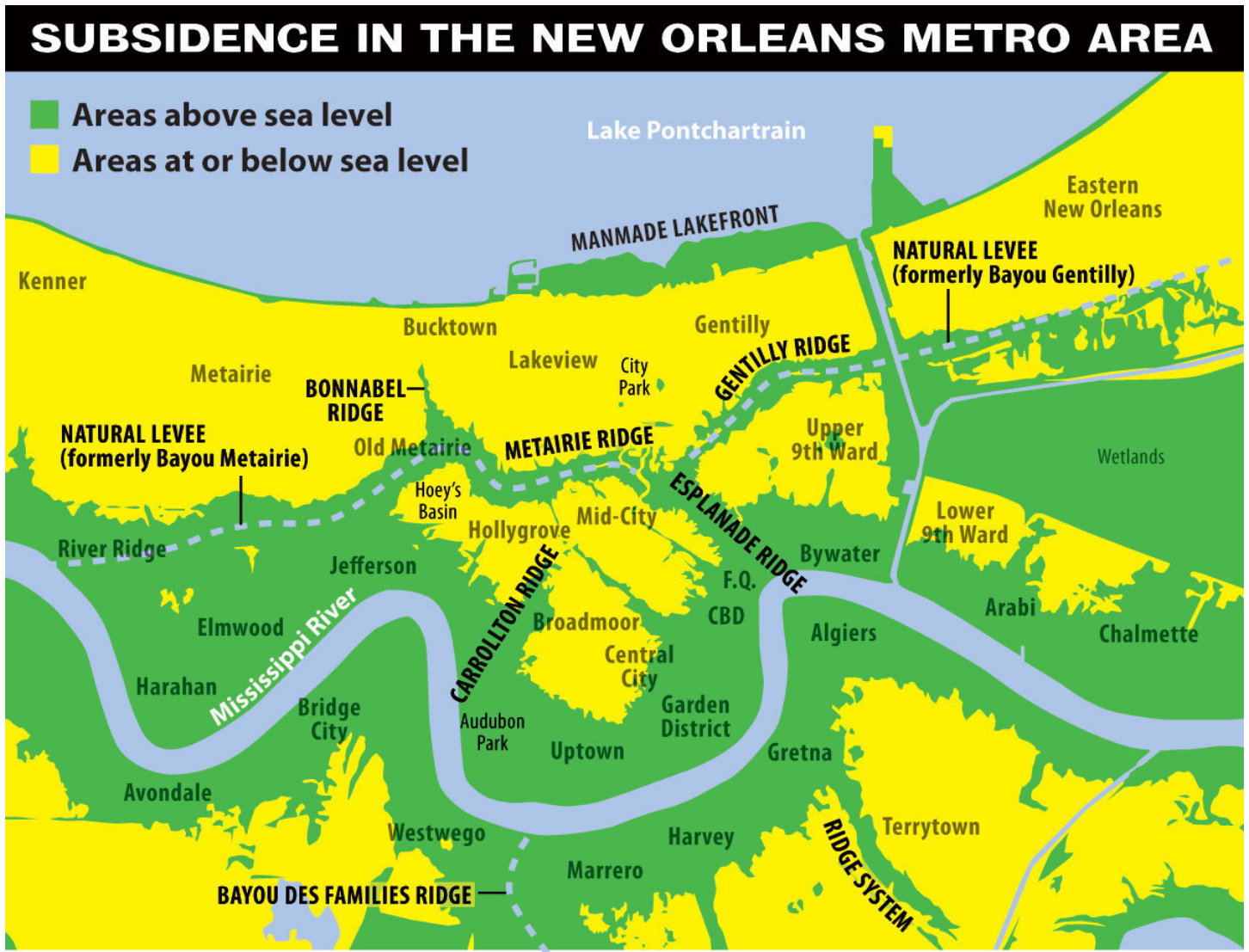
in turn opened up more spaces. Finely textured particles settled into those cavities, and the soil sunk.

Architects were among the first to notice the impact upon the cityscape. “Was the drainage of the city responsible for the settling of the old [St. Louis] cathedral wall a few days ago?,” pondered a 1913 article in the *Times-Picayune*. “Will similar breaks in the walls of all of the old downtown buildings occur, and will it force them to be rebuilt? These are two questions which are worrying New Orleans architects and engineers.”

By the 1930s, a metropolis that originally lay above sea level saw one-third of its land surface

sink below that level. By the 2000s, roughly half of the metropolis was below sea level — by 3 to 6 feet in parts of Broadmoor, 5 to 8 feet in parts of Lakeview and Gentilly, and 6 to 12 feet in parts of Metairie and New Orleans East. Why those spots? Because they were the lowest to begin with, and thus had the most water to lose closest to the surface and the most peat to oxidize.

The good news is that 50 percent of our metro area remains above sea level. The bad news is that it used to be nearly 100 percent above sea level, and it was we humans who sank it. The worst news is that our absolute rate of land sinkage roughly doubles when we measure it relative to the level of the sea — which is indisputably



Source: Tulane geographer Richard Campanella

Dan Swenson, NOLA.com | The Times-Picayune

rising. And, of course, it's the sea that makes this matter potentially deadly.

When Hurricane Katrina's surge ruptured the levees, it poured so swiftly and accumulated so deeply in so many areas because they had become bowl-shaped on account of manmade soil subsidence. Had a similar surge come upon an undrained and unsubsidized landscape, say 200 years ago, it would have generally washed off the next day. And, of course, those landscapes would not have been populated.

Instead, the Katrina deluge sat for weeks, impounded, on top of fully developed neighborhoods. People drowned in part because of the unforeseen effects of swamp drainage and soil subsidence.

In urban areas, there is no true solution for soil subsidence; it is not feasible to "reinflate" soils with water while urban life continues above.

It is beneficial, however, to restore a certain level of water content to the soil in the interest of slowing future sinkage. The key is to absorb or retain as much stormwater runoff as possible through porous surfaces, retention ponds, bioswales, rain gardens and widened and landscaped grade-level outfall canals.

## Recommended Citation

Campanella, Richard. 2018. "New Orleans Was Once Above Sea Level." *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/new-orleans-was-once-above-sea-level/>.

## About the Author

Richard Campanella, a geographer with the Tulane University School of Architecture and a Monroe Fellow with the New Orleans Center for the Gulf South, is the author of "Bienville's Dilemma: A Historical Geography of New Orleans," "Bourbon Street: A History," "Lincoln in New Orleans," "Geographies of New Orleans," and other books. He may be reached through [richcampanella.com](http://richcampanella.com), [rcampane@tulane.edu](mailto:rcampane@tulane.edu) or [@nolacampanella](https://twitter.com/nolacampanella) on Twitter.

As for undeveloped and undrained areas along the lower Mississippi River, it is possible, indeed imperative, to reverse further subsidence and erosion through coastal restoration techniques, such as river diversions, sediment siphons and the beneficial use of dredged sediments.

While we can't truly solve the problem of urban soil subsidence, we can effectively treat the symptoms—by building on piers and pilings above the grade, such that water in our yard does not become water in our house. A local industry exists to counter the effects of subsidence on structures, including sand-pit operators supplying fill and shoring specialists who jack up houses. One such outfit has been in business consistently since 1840, the same year Antoine's Restaurant opened. Apparently house leveling and fine dining make for job security in this town.

We can also acknowledge that topography matters, and that our higher ground is a valuable resource which ought to host higher populations.

Finally, we can learn the lessons of history—and geography, and of the tragic explosions in Metairie in the 1970s—by thinking long and hard before building new levees or draining and urbanizing any additional wetlands on this deltaic plain.

FORUM

# WATER AS A SOURCE OF REGIONAL COOPERATION IN THE MIDDLE EAST: THE WORK OF ECOPEACE MIDDLE EAST IN JORDAN, ISRAEL, AND PALESTINE

By Giulia Giordano

Water is at the core of sustaining all life on earth, and the people who have inhabited the arid and semi-arid lands of the Middle East and North Africa (MENA) region throughout the centuries know this very well. Scarcity of water in the region has shaped its history and geopolitics, including into the present day, with climate change and population growth putting more pressure on already scarce water resources (World Bank 2018).

Due to their geographical location, most MENA countries are characterized by arid conditions, low rainfall, and high levels of evaporation, leading to limited natural water resources. In addition, the region suffers from inefficient water usage, antiquated water infrastructure and networks, lack of institutional frameworks for managing transboundary water resources, and

pollution. The situation is further aggravated by climate change, which is projected to cause higher temperatures, less precipitation, extreme weather events such as droughts and floods, and sea level rise.

The region draws its water resources from rainwater, rivers, and underground water sheets. Declining precipitation has had unprecedented effects in the region, having an impact on the flow of surface water and the replenishment of several important aquifers. In addition, increased temperatures produce higher rates of evaporation, leading to further water loss. The rising of the Mediterranean Sea, induced by climate change, is expected to affect coastal aquifers, which already suffer from seawater intrusion due to over-exploitation.



*In the Water-Energy Nexus, solar energy produced in Jordan would be exchanged for desalinated water from Israel and Palestine. Image courtesy of EcoPeace Middle East.*



# The Role of Water Security

Recent literature highlights the central role of water security in ensuring sustainability, economic development, and political stability (Bar and Stang 2016, European Council 2008, Gleick 1993, OSCE 2015, Vitel 2011). According to the definition of water security advanced by the UN Water Program, water must be able to support health, livelihoods, socio-economic development, and ecosystems, which is why social, economic,

and political factors play an important role in shaping the ability of water to be properly served to the population. Conditions of water insecurity can trigger social tensions, and even lead to uprisings, and therefore pose a threat both domestically and to bordering states, regionally. This is particularly relevant in the case of a water-scarce and conflict-prone region like MENA, where a lack of adequate clean water has already



*Figure 1. The Jordan River is shared by Israel, Jordan, Palestine, and Syria. Holy to Christian, Jewish, and Muslim communities, today the Lower Jordan River has been heavily diverted for agricultural and domestic uses and is polluted by saline water and untreated sewage. Image courtesy of EcoPeace Middle East.*

led to food shortages, outbreaks of epidemic disease, mass migration, and political instability. Several commentators have underlined that one of the catalysts behind the social discontent that led to the uprisings known as the “Arab Spring” in Syria, as well as in Egypt and Yemen, was, to varying degrees, the water shortage experienced in the last few years due to a long period of drought (Dimsdale and Mabey 2018; Werrel, Femia, and Slaughter 2013).

As the state of water security across the region worsens, it is likely that new crises will occur in the near future, with potential implications at the regional and international level. The

United Nation’s first Water Development Report defined the water crisis as “essentially a crisis of governance and societies,” suggesting that issues of water security can be solved by enhancing water governance mechanisms and developing means of water diplomacy. The concept of water diplomacy is based on the assumption that management problems rather than scarcity of water are at the core of water security. Water diplomacy applies to bilateral and multilateral dialogue on water issues among people and states, by initiating processes at different political scales and levels in order to enhance water governance and cooperation, regional integration, development, security, and stability (Vetter, 2016).



*Figure 2. Israeli, Palestinian, and Jordanian mayors jump into the Jordan River in 2010, highlighting the importance of the river and its rehabilitation for all peoples and all three religions in the region. Image courtesy of EcoPeace Middle East.*

# Environmental Peacebuilding

Lack of regional cooperation in the MENA, mostly due to political conflict, has prevented the implementation of measures required to increase resilience to the detrimental impact of climate change on water, energy, and food security. While governments in the region seem to underestimate such menaces, subordinating them to more conventional military threats, voices are being raised from people across the region, demanding a more sustainable and peaceful future for the generations to come. The multi-award winning non-governmental organizations (NGO) EcoPeace Middle East is one of the most vocal environmental group in the region. Founded 24 years ago by a group of visionary environmentalists with the objective to promote sustainable regional development as a pathway to peace, EcoPeace has offices in Jordan, Israel, and Palestine. The three countries are among the world's lowest in terms of renewable fresh water supplies per capita, and share surface and groundwater resources.

Even in the midst of one of the longest and most controversial conflicts of the region, EcoPeace has proved that by developing means of

environmental peacebuilding and water diplomacy, regional cooperation can help resolve existing political strife and prevent further conflict from developing over scarce resources. By combining bottom-up community engagement activities with a top-down advocacy strategy, EcoPeace has relentlessly worked to find shared solutions to the common water problems affecting the three countries, and has helped advance concrete answers with an impact on national policies and real benefits to people on the ground. EcoPeace has had many achievements over the years. EcoPeace has contributed to stopping the construction of the Israeli separation barrier from being built in the ancient terraced agricultural landscape around the Palestinian town of Battir; has advocated for the release of fresh water from the Sea of Galilee into the lower Jordan River; has leveraged over \$500 million worth of investments in projects related to water supply and sanitation solutions in Palestine, Jordan, and Israel; and has led important changes in policies related to increased water and electricity supply to Gaza, to name a few.

## A Master Plan for the Jordan Valley

The environmental degradation of the Jordan River and the state of underdevelopment of the surrounding communities are examples of how ineffective and unilateral management of shared resources is harmful to Jordanian, Israeli, and Palestinian populations. Political boundaries divide the river; instead of seeing the river as a single transboundary watershed, the riparian states have raced to capture the greatest possible share of the valley's water. Holy to Christians, Jews, and Muslims, the river has seen its cultural and natural heritage sites decimated. Of the 1,300

million cubic meters of water that would naturally flow down the River Jordan to the Dead Sea each year, approximately 95 percent is diverted for domestic and agricultural uses by the riparian states. EcoPeace estimates that Israel diverts about half of the river's average annual flow, while Syria and Jordan take about a quarter each. Due to Israeli military restrictions, Palestinians do not receive water directly from it. What little water remains is polluted with agricultural runoff, saline water and untreated sewage. Residents, as well as tourists, have limited access to the

river. In 2015, EcoPeace released the first-ever integrated Regional Jordan Valley Master Plan, a comprehensive plan for the rehabilitation and sustainable development of the Jordan Valley, in Jordan, Israel, and Palestine. The river cannot be sustainably managed through a process of

competition; therefore, advancing the strategy detailed in the master plan can serve as the engine for regional cooperation, rehabilitate the Jordan River, and create opportunities of shared prosperity.

## Developing a Water-Energy Nexus

Recently, EcoPeace has embarked on an ambitious project to explore the concept of developing a regional community of water-energy among

Jordan, Israel, and Palestine. The proposed Water-Energy Nexus (WEN) would create a relationship of interdependency whereby Israel



*Figure 3. Youth and alumni of EcoPeace Middle East gather at the baptism site on both the Israeli and Jordanian sides of the Jordan River in order to campaign for the river's rehabilitation. Image courtesy of EcoPeace Middle East.*

## ISSUE ELEVEN : SUMMER 2018

and Palestine would produce desalinated water and supply it to Jordan, while Jordan would use its vast open spaces to supply Palestine and Israel with renewable energy, thereby enabling each partner to harness their comparative advantage in the production of renewable energy and water.

Water desalination has been practiced for more than 50 years in the region and has become the primary response to water shortage in Israel. Indeed, in the last decade, the country has invested extensively in the research and development of new water technologies. Today Israel has become one of the world leaders in desalination, water treatment and reuse, including sophisticated agricultural technologies that reduce the

consumption of water. As of today, both Palestine and Jordan buy water from Israel to meet their increasing demands. Desalination is an energy intensive process, and thus, wide-scale desalination, a primary climate adaptation strategy for the region, could end up being a major source of greenhouse gases (GHGs). Israel, Jordan, and Palestine have all signed the 2015 Paris Climate Accords and are committed to reducing GHGs. While all three have goals for increasing the share of energy supplied by renewable sources, currently renewables represent a small percentage of total energy consumption in any of the countries. The links between water and energy are increasingly recognized across businesses, governments, and the public. Thinking about water and energy



*Figure 4. In the Water-Energy Nexus, solar energy produced in Jordan would be exchanged for desalinated water from Israel and Palestine, establishing an interdependent relationship in which each of the parties involved would become more water and energy secure within a framework of broader regional cooperation. Image courtesy of EcoPeace Middle East.*

in an integrated way is essential if the region is to reach water security and foster overall stability.

EcoPeace has released a prefeasibility study of the WEN initiative, which explored the viability of the proposed exchanges. Results show that these exchanges are technically feasible and potentially offer substantial economic, environmental, and geo-political benefits to each of the parties that would provide strong incentives for sustained cooperation. Jordan would become a major exporter of green energy, providing the revenue needed to purchase desalinated water

from Israel and Palestine. As a result, Palestine would become less dependent on Israel for both water and energy. Israel would meet its Paris climate commitments at the cheapest cost and see regional cooperation strengthened. Supplying water via desalination within the context of the aforementioned water-energy exchanges would allow for significant reduction to the environmental impacts of water supply, reducing not only greenhouse gases, but local air pollutants, as well. The broader international community and all concerned parties who fear that climate change and water insecurity will further threaten



*Figure 5. Jordanian, Palestinian, and Israeli youth canoe down the Jordan River. The Jordan River is a valuable part of the shared environmental heritage of the region, and proves the importance of cooperation over transboundary water resources. Image courtesy of EcoPeace Middle East.*

regional stability would see water and energy security advanced in a manner that creates healthy interdependencies. WEN's potential impact also goes beyond Jordan, Israel, and Palestine. In the broader Middle East, it could expand to include additional countries, and be a model for optimizing natural resource management via collaboration between hinterland and coastal areas.

As the history of Europe exemplifies, regional integration emerged from the ashes of WWII as a response to the devastation and death caused by the war. From the visionary declaration pronounced by French Foreign Minister Robert Schuman on May 9, 1950, six European governments, determined to prevent another

war, established the European Coal and Steel Community, which would—in the words of the declaration—make war between historic rivals France and Germany “not merely unthinkable, but materially impossible.” That pioneering institution evolved into the present-day European Union. Therefore, cooperation in the Middle East is necessary, not in spite of the existing conflicts, but as a response to them. Riddled by years of conflicts, endemic poverty, and environmental degradation, the governments of the region need to identify their natural resources as a shared heritage, which could generate mutual benefits and shared prosperity. As Schuman explained, “World peace cannot be safeguarded without the making of creative efforts proportionate to the dangers which threaten it.”

## For Further Reading

Bar, Ido, and Gerald Stang. 2016. “Water and insecurity in the Levant,” *European Union Institute for Security Studies* (EUISS), April 2016.

Dimsdale, Taylor, and Mabey, Nick. 2018. “MENA Stability in a Changing Climate – A Transatlantic Agenda on Preventative Investment.” *E3G*, March 2018. <https://www.e3g.org/library/mena-stability-in-a-changing-climate-a-transatlantic-agenda-on-preventative>.

EcoPeace Middle East / Konrad-Adenauer-Stiftung. 2017. “Water Energy Nexus. A Pre-feasibility Study for Mid-East Water-Renewable Energy Exchanges,” edited by David Katz and Arkady Shafran. Amman, Jordan: [http://www.kas.de/wf/doc/kas\\_51857-1522-2-30.pdf?180319121412](http://www.kas.de/wf/doc/kas_51857-1522-2-30.pdf?180319121412).

EcoPeace Middle East and Royal Haskoning DHV. 2015. “Regional NGO Master Plan for Sustainable Development in the Jordan Valley.” [http://foeme.org/uploads/Regional\\_NGO\\_Master\\_Plan\\_Final.pdf](http://foeme.org/uploads/Regional_NGO_Master_Plan_Final.pdf).

Eran, Oded, Institute for National Security Studies (INSS), Gidon Bromberg, and Giulia Giordano, EcoPeace Middle East. 2018. “Israeli Water Diplomacy and National Security Concerns.” *EcoPeace Middle East*, January 2018.

European Council. 2008. “Climate Change and International Security: Paper from the High Representative and the European Commission to the European Council.”

European Union. “The Schuman Declaration—9 May 1950.” European Union website. [https://europa.eu/european-union/about-eu/symbols/europe-day/schuman-declaration\\_en](https://europa.eu/european-union/about-eu/symbols/europe-day/schuman-declaration_en).

Gleick, Peter H. 1993. "Water and Conflict. Fresh Water Resources and International Security." *International Security*, Vol. 18, No. 1, Summer 1993.

Office of the Coordinator of OSCE Economic and Environmental Activities (OSCE). 2015. "Water governance in the OSCE area—Increasing security and stability through co-operation." *Compilation of Consolidated Summaries*, 23rd OSCE Economic and Environmental Forum.

United Nations University; UNU-INWHE Institute for Water, Environment, and Health; and United Nations Economic and Social Commission for Asia and the Pacific. 2013. "Water Security & the Global Water Agenda," UN-Water Analytical Brief. *United Nations University*, October 2013. <http://www.unwater.org/publications/water-security-global-water-agenda/>.

World Water Assessment Programme. 2003. "Water for People Water for Life: The United Nations World Water Development Report," March 2003. [http://www.un.org/esa/sustdev/publications/WWDR\\_english\\_129556e.pdf](http://www.un.org/esa/sustdev/publications/WWDR_english_129556e.pdf).

Vitel, P. 2011. "Food and Water Security: Implications for Euro-Atlantic Security." Report to the Sub-Committee on Energy and Environmental Security of the NATO Parliamentary Assembly, November 2011.

Vetter, Thomas 2016. "Water Connects: A Short Guide to Preventative Water Diplomacy" Berlin, Adelphi.

Werrell, Caitlin E., Francesco Femia, and Ann-Marie Slaughter. 2013. "The Arab Spring and Climate Change: A Climate and Security Correlations Series." *Center for American Progress, Stimson and The Center for Climate and Security*, February 2013. <https://cdn.americanprogress.org/wp-content/uploads/2013/02/ClimateChangeArabSpring.pdf>.

World Bank. 2018. "Beyond Scarcity: Water Security in the Middle East and North Africa." *MENA Development Report*. <http://www.worldbank.org/en/topic/water/publication/beyond-scarcity-water-security-in-the-middle-east-and-north-africa>.

## Recommended Citation

Giordano, Giulia. 2018. "Water as a Source of Regional Cooperation in the Middle East: The Work of EcoPeace Middle East in Jordan, Israel, and Palestine." *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/the-work-of-ecopeace-middle-east/>.

## About the Author

Giulia Giordano is the International Affairs Manager at EcoPeace Middle East, a trilateral organization based in Israel, Jordan, and Palestine. Formerly she was a visiting researcher at the Hebrew University of Jerusalem and a fellow lecturer at Al-Quds University in East Jerusalem, where she taught two courses in Human Rights and International Environmental Law. She received her PhD in Cooperation for Peace and Development from the University 'Stranieri' of Perugia. Her research interests are Middle Eastern studies, the Israeli-Palestinian conflict, and environmental diplomacy.



FORUM

# WATER, CONFLICT, AND PEACE

By Peter Gleick

**W**e live on a water planet. As the writer Arthur C. Clark noted, if we didn't happen to be land-dwelling creatures, we would call our planet Ocean, rather than Earth. And for humans, fresh water is critical for life, health, our economies, and vibrant ecosystems. The vast majority of water on the planet—more than 97 percent—is salt water, in our oceans. Most of the small fraction that is freshwater is locked away in ice caps, glaciers, and deep groundwater. Yet the little bit of water left over in the form of rain, flowing rivers, lakes, and accessible soil moisture is what grows our food; powers spinning turbines; feeds our industries, businesses, and homes; and provides for recreational, artistic, and spiritual support.

Every child learns about the hydrologic cycle in school, and every day we see evidence of it in clouds, falling rain and snow, and running streams and rivers. Yet we also know that fresh water is unevenly distributed around the world with dry, arid deserts in some regions, rainforests and monsoon climates in others, with wet and dry seasons, and with extremes of weather in the form of both droughts and floods.

It is this uneven distribution of water, and the uneven distribution of money, technology, and institutions to manage our water, that contributes to some of the global challenges we face. There is no lack of water crises: toxic water contamination, water-related diseases, inadequate access to



*A landscape of water in Kyrgyzstan. Photographer Frantisek Duris.*

safe and affordable drinking water and sanitation for billions of people, death and destruction from extreme hydrological events, collapsing fisheries and disappearing wetland ecosystems, and now human-caused climate change. These crises cause widespread human suffering. The United Nations estimates that more than a million people die every year from preventable water-related diseases. Floods and droughts kill thousands of people at a time and cause billions of dollars of damage. Bird and fish populations are plummeting as critical wetland habitat and rivers are drained, dammed, and polluted. These challenges are well understood, and for decades scientists, policy makers, activists, academics, and concerned citizens have worked to solve water problems. Great progress is being made, but much remains to be done, requiring new technology, better information and data, advances in science, smarter management

and water institutions, and innovative economic approaches.

But one major water challenge remains under-appreciated and under-addressed: the growing threat of violence and conflicts over water resources. Water can be a source of both cooperation and conflict: history is replete with examples of both. But violence over water appears to be waxing, not waning, as pressures over limited water grow, as populations and economies expand, and as war and violence spill over into the civilian sector.

The issue is not “water wars,” despite the euphonious and alliterative nature of the term and the attractiveness to headline writers. Wars are big, brutal, miserable things, and they start for complex economic, political, ideological, religious,



*Water pollution on the Latvian coast.*

and historical reasons. Rarely is any “war” (and there are no single accepted definitions of what conflicts rise to the level of “war”) attributable to a single cause. Yet it is indisputable that fresh water is—and has been for millennia—a trigger, weapon, and casualty of conflict, violence, and war. A project of the Pacific Institute for nearly three decades has tracked the history of water-related violence in its open-source database: The Water Conflict Chronology.<sup>[1]</sup> Currently with over 500 entries, going back nearly 5,000 years, the database includes examples from every region of the world except Antarctica.

Disturbingly, reports of water-related violence are on the rise, with a serious spike in the past

decade. And the vast majority of entries involve non-state actors: individuals, non-governmental militias, and civil conflicts, rather than nation-to-nation disputes. This increase may in part reflect better reporting, but it is also well correlated with water-scarce regions of the world where rising populations and growing economies must compete for fixed and often seriously limited amounts of water. In addition, while many shared international rivers do not have formal treaty agreements among the nations sharing those rivers, nation-to-nation violence is more likely to be constrained by international political and diplomatic tools and norms. The same cannot be said for sub-national violence.



*Piazza di Spagna and Fontana della Barcaccia in Rome. The fountains in Rome are not only artwork, but were also built as critical urban infrastructure in response to economic and population pressures of their time.*

## ISSUE ELEVEN : SUMMER 2018

Violence over water through history takes three forms: water as a trigger of violence, water resources and water systems as weapons of conflict, and water infrastructure as targets or casualties of conflicts. Each of these is described below, but note that some historical accounts of violence associated with water can be associated with more than one form. The Hwacheon Dam in Korea, completed in 1944, was both a target and a tool of opposing forces during the Korean War.

In 1951, North Korea opened the dam to flood downstream areas and slow advancing UN forces. In response, the U.S. Navy sent aircraft to bomb the dam. In the 1990s Saddam Hussein reportedly poisoned and drained the water supplies of southern Shiite Muslims, the Marsh Arabs (or Ma'dān). These are examples of water resources being both a weapon of conflict and a target or casualty, as well.



*Marsh Arabs poling a traditional mashoof in the marshes of southern Iraq. Photographer Hassan Janali, U.S. Army Corps of Engineers.*

# Water as a Trigger

The first category is the most clearly related to water scarcity and competition for resources. When water is scarce, or access to water is constrained for political or ideological reasons, conflict can result. In AD 90 Josephus wrote about the diversion of a stream to Jerusalem by the Roman Procurator Pontius Pilate in AD 30 and a deadly attack by Roman soldiers on the crowds that gathered to protest. Disputes over access to water and water rights in the western United States in the 1800s led to violence between farmers and rangers. Between 1907 and 1913, the Los Angeles Valley aqueduct/

pipeline was repeatedly bombed in an effort to prevent diversions of water from the Owens Valley to Los Angeles. Most recently, in places as diverse as India, Sudan, the western United States, and southern Africa, violence triggered by disputes over access to fresh water has killed and injured many people. And because populations worldwide are growing and total available water is fixed, water scarcity is rising. Complicating these factors is the reality that human-caused climate change is already observed to be affecting the hydrologic cycle, water scarcity, and extreme hydrologic events.



*Whitsett Pumping Plant on Lake Havasu lifts the water 291 feet (89 m) for the Colorado River Aqueduct, bring water to Los Angeles. Photographer Charles O’Rear, 1972.*

# Water as a Weapon

The earliest entries in the Chronology are examples of the use of water as a weapon, including both historically documented cases as well as classic myths and legends. The biblical story of Noah and the flood, which has roots in the ancient Sumerian legend of the deeds of the deity Ea, relates the use of water as a weapon to punish humanity for its sins. Around 2450 BC, in “Gu’edena” (edge of paradise) region between the Tigris and Euphrates Rivers in

ancient Mesopotamia, the king of Lagash diverted water from irrigation canals as a weapon in a dispute with the neighboring city-state of Umma. Between 700 and 400 BC there are numerous accounts from Egypt, Persia, Babylon, and Assyria of the diversion of rivers and the poisoning of wells as weapons of war. In 1642 toward the end of the Ming dynasty in China, dikes restraining the Huang He River were intentionally breached for military purposes, killing thousands. And in



*The Deluge engraving by William Miller after John Martin which takes inspiration from the story of the flood in the first book of the Bible, in which God punished man’s wickedness by destroying nearly every living thing on earth. Published in *The Imperial Family Bible According to the Authorized Version* (John Martin Illustrator) Glasgow, Edinburgh, and London: Blackie & Son. 1844.*

the recent violence in Iraq and Syria, dams along the Euphrates and Tigris Rivers have been a locus of conflict, with water being repeatedly and intentionally held back or released in the form of floods for military purposes.

See the *Memorial Cone of Mesilim*, in the Louvre Museum, which depicts the earliest recorded conflict over water in BC 2450 between the city-states of Umma and Lagash in ancient Mesopotamia, described above.

## Water as a Casualty of Conflict

The third category of water-related violence is the targeting of water resources and water systems during wars and conflicts, regardless of the root cause. International humanitarian laws, or “the laws of war” such as the 1949 Geneva Convention and the 1977 Additional Protocols to the Geneva Convention, provide explicit protections to civilians and critical infrastructure that supports civilian populations, including explicitly water

systems. Despite these protections, water sources, pipelines, treatment plants, dams, and irrigation systems are regularly damaged and destroyed either intentionally or as collateral damage, leaving large populations without access to safe water and sanitation and contributing to the forced migration of refugees. As with the other categories, there is a long history of such cases. Even the *Old Testament* Book of Chronicles relates



*Dragan Dam in Romania. Photographer Colin Woodcock.*

## ISSUE ELEVEN : SUMMER 2018

the story of how King Hezekiah of Judah had springs and a brook outside Jerusalem stopped to keep water from the Assyrians coming to war (“So there was gathered much people together, who stopped all the fountains, and the brook that ran through the midst of the land, saying, Why should the kings of Assyria come, and find much water?” 2 Chronicles 32:1–4). Wells have been poisoned throughout history as a casualty of war

(note that the offensive use of this tactic falls under water as a “weapon”), including in the early 1900s in German Southwest Africa, 1999 Kosovo, Angola, and East Timor, and the civil war in the Sudan between 2003 and 2007. More recently, civilian water supply systems have been regularly attacked during the Syrian and Yemeni civil wars, contributing to a massive outbreak of cholera in Yemen.



*Hanging wet clothes to dry in Pushkar, India. In 2010, the United Nations formally declared a human right to water and sanitation for basic needs.*



# Reducing the Risks of Water-related Conflicts

Reducing the risks of violence over fresh water requires that we first understand the root causes, and second, work to reduce the factors that contribute to water and conflict. Where water is a “trigger” of conflict, the principal factors include water scarcity and disputes over access to water sources. When populations are deprived of water, or lack control over local resources, tensions arise. Absolute scarcity of water is typically not the problem; instead, it is the maldistribution of water or of water infrastructure, combined with uncertain or conflicting legal rights to water that most contribute to tensions arising over access to fresh water.

When such tensions are exacerbated by the lack of effective institutions or governance mechanisms to manage and allocate water, violence is more likely to ensue., and the UN Sustainable Development Goals include the target of providing 100 percent of the world’s population with safe and affordable water and sanitation by 2030. Achieving this target will be extraordinarily difficult, given the current scope of the challenge, but doing so would help to reduce tensions over access to water.

Where water is a weapon of war or a target and casualty of war, international norms of behavior are vitally important—hence the creation over the history of civilization of guidelines, standards, and laws setting limits to protect civilian populations and the natural environment. Such codes of behavior extend back thousands of years in texts from early Sanskrit, Jewish, Christian, Islamic, and other cultures that offer guidelines for the conduct of war and the treatment of non-combatants. In 1439, Charles VII of Orleans ruled that officers would be held responsible for

‘the abuses, ills and offences’ committed by the men they commanded. The Lieber Code of 1863, promulgated by President Lincoln during the U.S. Civil War, provided guidance for Union armies in the field and stated

“Military necessity...does not admit of the use of poison in any way, nor of the wanton devastation of a district. It admits of deception, but disclaims acts of perfidy; and, in general, military necessity does not include any act of hostility which makes the return to peace unnecessarily difficult.” (Section 16)

And

“The use of poison in any manner, be it to *poison wells*, or food, or arms, is wholly excluded from modern warfare. He that uses it puts himself out of the pale of the law and usages of war.” (Section 70, emphasis added)

The early declarations informed more comprehensive international law that began to take shape with the 1899 and 1907 Hague Conventions and Declarations. The purpose of the 1907 Hague Convention was laid out in the preamble: “to diminish the evils of war, as far as military requirements permit.” It included the famous Martens Clause:

Until a more complete code of the laws of war has been issued, the High Contracting Parties deem it expedient to declare that, in cases not included in the Regulations adopted by them, the inhabitants and the belligerents remain under the protection and the rule of the principles of the law of nations, as they result from the usages established among civilized

peoples, from the laws of humanity, and the dictates of the public conscience.

The Hague declarations include articles protecting basic infrastructure such as water systems, undefended towns, villages, dwellings, or buildings (Article 25), and call for sparing “as far as possible, buildings dedicated to religion, art, science, or charitable purposes, historical monuments” and medical facilities “not being used at the time for military purposes” (Article 27).

Following World War II, new efforts were made to develop legal protections for civilians and infrastructure. The 1949 Fourth Geneva Convention prohibits deliberate or indiscriminate destruction of property belonging to individuals or “the

State, or to other public authorities” (Article 53) and “extensive destruction and appropriation of property, not justified by military necessity and carried out unlawfully and wantonly” (Article 147). The most explicit protections for water-related infrastructure, however, were not put in place until the addition of the 1977 Protocols to the Geneva Convention, designed to protect victims of international and non-international armed conflict. These agreements limit the means and methods of warfare that cause “superfluous injury or unnecessary suffering” or “widespread, long-term and severe damage to the natural environment, prohibit indiscriminate attacks on civilians and civilian infrastructure, and protect civilian infrastructure critical to the survival of civilian populations including explicitly “*drinking*



*Qadisiyah Reservoir on the Euphrates River, Iraq. This image, taken in 2009, shows the reservoir at less than half its size in 2003 due to human consumption of water for drinking and agriculture. Image via NASA.*

*water installations and supplies and irrigation works.”* Militaries are to avoid attacking such installations so as not “*to leave the civilian population with such inadequate food or water as to cause starvation or force its movement.*”

Given the large and growing number of examples of attacks on water systems and the serious adverse consequences for civilian populations, existing humanitarian laws of war as currently framed, interpreted, or applied are inadequate: They have failed to prevent attacks on civilian water systems and to impose sufficient liability

on governments in a way that offers effective constraints on military operations against such infrastructure. Part of the problem is that international laws are mostly focused on limiting intentional attacks on civilians and the use of specific instruments of war, like chemical and biological weapons. Less attention has been paid to the secondary or indirect health consequences of the destruction of civilian infrastructure, raising the question of how to push legal reforms to more explicitly protect critical civilian water systems and infrastructure and improve enforcement mechanisms of existing laws.

## Conclusion

Water is a critical resource for the production of food, goods, and services, the health of humans and natural ecosystems, and the successful functioning of modern society. Violence and conflict related to water resources are worsening for many reasons, including growing populations and water demand, expanding economies, widespread water contamination, worsening human-caused climate change, and weak water management and

governance. Strategies for reducing water-related conflicts exist, including improvements in technology, more sustainable water supply and demand options, and a wide range of legal, political, and institutional tools. But unless these are more quickly and widely deployed, the risks of conflicts over water seems likely to continue to worsen.

## Footnotes

[1] [www.worldwater.org](http://www.worldwater.org)

## Resources and Additional Reading

Gleick, Peter. 2017. *Water and U.S. National Security*. The WarRoom, United States Army War College, Carlisle, PA. At <https://warroom.armywarcollege.edu/articles/water-u-s-national-security/> (June 15, 2017).

Reed, David, ed. 2017. *Water, Security and U.S. Foreign Policy*. New York: Routledge Press.

*The World's Water: The Report on Freshwater Resources* (Volumes 1-9). Washington, D.C.: Island Press and the Pacific Institute, Oakland, California. P.H. Gleick (editor). [www.worldwater.org](http://www.worldwater.org).

The Water Conflict Chronology. *The World's Water*. Pacific Institute. At <http://www.worldwater.org/water-conflict/> (updated May 2017).

## Recommended Citation

Gleick, Peter. 2018. "Water, Conflict, and Peace." *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/water-conflict-and-peace/>.

## About the Author

Dr. Peter Gleick is a hydroclimatologist, a member of the U.S. National Academy of Sciences, a MacArthur Fellow, and co-founder of the Pacific Institute in Oakland, California. For over thirty years, he has studied global water and climate challenges and has worked to develop effective solutions with a focus on climate change, the human right to water, and water and conflict. He is the editor and co-author of the regular book series, *The World's Water: The Report on Freshwater Resources*.

FORUM

# MEANDERING AND RIVERSPHERE: THE POTENTIAL OF PARADOX

By Irene J. Klaver

**H**eraclitus of Ephesus (535 BCE-475 BCE) was the master of paradox: “It rests by changing,” “a thing agrees at variance with itself,” and “the same: living and dead, and the waking and the sleeping, and the young and the old” (Kahn 1979, Fragments LII, LXXVIII, XCIII). Both Plato and Aristotle saw his views as logically incoherent and inconsistent with the law of

non-contradiction. How can one think living and dead, young and old, warm and cold, wet and dry as being the same? Heraclitus’s point, however, is that opposites are not separate and identical entities, but that they are relational, each other’s transformational equivalents, and on co-constitutive, ontologically and epistemologically speaking. “Cold warms up, warm cools off, moist



*Image courtesy of Brian C. O'Connor, 2009.*

parches, dry dampens” (Kahn 1979, Fragment XLIX). Without the experience of cold, one would not know warmth, and vice versa.

We find another kind of paradoxical statement from Heraclitus in one of his most famous sayings: “one cannot step twice into the same river” (Kahn 1979, Fragment LI). A similar, but longer, fragment gives a further insight in Heraclitus’s notion of the same: “as they step into the same rivers, other and still other waters flow upon them” (Kahn 1979, Fragment L). The tension is between “same” and “other.” The river stays the same, it stays a river, precisely because the waters become other, that is, the water flows. If there were no flow, the river would be a lake or a wetland. And because the waters flow, they are always different, that is, other; in that sense one cannot step twice into the same river. When one

puts one’s feet into the river again, one encounters different waters, different sediments, twigs, fish, insects... However, one could put one’s feet at the same Cartesian cartographic coordinates again and again.

In the following, I expand on various aspects of this dynamic. I sketch paradoxes emerging in the sociocultural and economic trajectories of water in the modern era, and show the sense of logic—and its concomitant model of efficiency—dominant in modern western thought. I develop a riverine or, say, Heraclitean, model, to situate contemporary developments of re-connecting to water, specifically to urban rivers, in a more sustainable and equitable way.[1] I conclude by taking the story-arc of the Los Angeles River as paradigmatic example of new paradoxes emerging in such re-connecting.

## There It Is—Take It

“There it is—take it!” With this legendary concise dedication speech, William Mulholland inaugurated the brand-new Los Angeles Aqueduct in 1913 (Mulholland 2000, 246). With these words, he had initiated not only an aqueduct, but also an era, a new mentality, a modern lifestyle, a stratification of rivers into aqueducts and reservoirs (Klaver and Frith, 2014).

Large-scale water-infrastructure projects became paradigmatic for the twentieth century. Wildly diverse water bodies – rivers, streams, lakes, wetlands, estuaries, and aquifers – were pumped, piped, stratified, dammed, diverted, and converted, yielding a staggering loss of ecological and cultural diversity. Just in the realm of dam building, the World Commission on Dams (WCD) estimates that between 1945 and 2000, 40 to 80 million people worldwide were evicted to accommodate large dam developments—the majority being Indigenous peoples and ethnic minorities (Johnston 2012, 304; WCD 2000). Add to this at

least 427 million river-dependent people whose downstream ways of life have basically been obliterated by the effect of hydro-development (Richter et al. 2010). One can also see water development as one of the major factors in the global decline of both ecological diversity and cultural diversity (Johnston 2012, 305). Irrigated agriculture and thirsty cities have dammed rivers or re-routed them into complex river-linking schemes and changed natural lakes and aquifers into shrinking remnants of themselves, heavily impacting biocultural and hydro-ecological diversities. Water flowed into the twenty-first century homogenized as a marketable and transferable economic commodity.

The very fluidity of water allows it to be stratified, dammed, canalized, sold, diverted and paved over into sheer infrastructure or concrete “riverbeds” and aqueducts. Like a Heraclitean paradox, the very same fluidity enables a rethinking and reorientation toward reconnecting and

revitalizing rivers within processes of biocultural conservation and cultural diversification. In the following, I develop tools to conceptualize this new biocultural mentality, specifically focusing on urban rivers in the wealthier or so-called developed world.

The twenty-first century is the century of the city. In 2007, the global urban population, for the first time in history, surpassed the rural population. According to the 2014 United Nations Report, World Urbanization Prospects, 66 percent of the world's population is projected to be urban by 2050. The report emphasizes that sustainable development challenges will concentrate in cities

and will require integrated policies (UN DESA 2014, 1–7). These trends urge us to rethink urbanism in terms of cities as agents of change rather than mere engines of growth – change for greater social justice and environmental sustainability. How we imagine cities and envision “urban citizenship” (Amin, Massey, and Thrift 2000) in this new century is of critical importance. I take the urban riverfront as a prism through which paradoxes of riverine management, improvement, and urban development come into focus. With increased pollution and occasional severe flooding, living close to urban waterways in the nineteenth and twentieth centuries was often unhealthy, if not dangerous: a place for



*The opening of the Los Angeles Aqueduct. On November 5, 1913, thirty thousand Angelenos gathered to celebrate the opening of the Los Angeles Aqueduct. As the first cascade of water sluiced down the Newhall Spillway (pictured above) and into the San Fernando Valley, William Mulholland roared to the crowd: “There it is – take it!”*

poor neighborhoods. Changing environmental policy and legislation since the 1970s cleaned up many rivers – a positive trend, often resulting in negative consequences for the traditional occupants of river regions. Waterfront property is now highly desirable real estate. Highly-priced property values result in gentrification, with socio-economic and cultural homogenization and environmental justice issues in its wake.

## Riversphere

Rivers are more than blue lines on a map, more than their basins, their watersheds, or drainage areas. They influence the geology, the air, and soil around them, life around them, cultures around them (Klaver 2012). They create their own hydrospheres, biospheres, and atmospheres. They form intricate networks of relations and conditions of possibilities. I specify the concept of riverine atmosphere as “riversphere” to examine rivers as places of multi-scalar and multi-vector connectivity and complexity.

My sense of riversphere resonates with Gernot Böhme’s concept of atmospheres:

Atmospheres are indeterminate above all as regards their ontological status. We are not sure whether we should attribute them to the objects or environments from which they proceed or to the subjects who experience them. We are also unsure where they are. They seem to fill the space with a certain tone of feeling like a haze. (Böhme 1993, 114)

The notion of riversphere as atmosphere adds social, political, cultural, aesthetic, and emotional dimensions to our thinking about rivers and cities. It resonates with the notion of ambiance, such as the cosmopolitan and open ambiance of a city (Amin, Massey, and Thrift 2000). Riversphere is a thick concept. It enriches the

To envision re-valuing, re-imagining, and re-vitalizing rivers as processes of biocultural conservation and cultural diversification, I present a model based upon two key riverine facets: meandering and riversphere. Both are based in the material, ecological, and hydrological workings of rivers and the diverse cultural relations these processes engender. Thus, urban re-connecting to a city’s river is co-constituted by a joint agency of the river and the urban citizens.

conceptualization of rivers in the cultural imagination, intertwining hydrological, biological, and ecological knowledge and experience with lived experience, social cultural and political activities, story-telling, and the like. In *Hydraulic City: Water and the Infrastructures of Citizenship in Mumbai*, Anand emphasizes the power of stories:

Stories have multiple vocalities and multiple sites of production. Unlike discourses, stories are particularly attendant to the diverse locations at which human agency is thwarted or dreams are partially realized. Stories are unstable.... The telling of stories is always a political act. (Anand 2017, vii–viii)

Anand develops a notion of hydraulic citizenship predicated upon the deep intertwinement and entanglement of the dynamic infrastructural water flows in pipes and pumps, with citizens, technicians, politicians, plumbers; it is a complex vibrant mix of theories, stories, stuff, facts, politics, acts, expectations and experiences, engagements and dreams. In this realm of multiplicity and instability the potential of paradoxes emerges, providing specificity to processes: who and what is acting, or acted upon, shifts depending on the situational perspective.

Theories of complexity are well suited to a twenty-first-century era of high technology,



globalization, urbanization, and climate change. As John Law and John Urry state:

With its many convergent, overlapping and irreversible interdependencies ‘globalization’ is remaking ‘societies’ but not in a linear, closed and finalized form. We might see the growth and spreading of theories of complexity as part of, and simultaneously helping to enact, the very processes of global change. (Law and Urry 2005, 404)

Within a riversphere and meander approach, geometrical and homogenizing models of nature and city planning give way to models of complexity and indeterminacy (Klaver 2017), thereby giving room to biocultural conservation, to multiple models of flow—not just flows of water, but of sediments, animals, plants, soils, people, capital, light, luggage, tourists, money, exchanges, and experiences.

Urbanization in a globalizing world comes with many forms of injustices. Urban reconnecting to rivers in the developed world often results in social inequity and environmental justice issues, especially in terms of gentrification (Kibel 2007). I, therefore, include as a critical component of riversphere, an emphasis on the river as *shared* space, invoking the notion of common, as in David Harvey’s conceptualization of “right to the city:”

The question of what kind of city we want cannot be divorced from that of what kind of social ties, relationship to nature, lifestyles, technologies and aesthetic values we desire. The right to the city is far more than the individual liberty to access urban resources: it is a right to change ourselves by changing the city. It is, moreover, a common rather than an individual right since this transformation inevitably depends upon the exercise of a collective power to reshape the processes of urbanization. (Harvey 2008, 23)

The crucial word here is “common.” The center of Harvey’s right to the city is the shift from an individual right to a common right. Water affords the materiality, medium, and framework or model to think this common, to think the “with.”

Thinking “with” includes the acknowledgement of opposition(s), of resistance, of paradox. The words river and rival are etymologically related, rooted in the Proto-Indo-European \**rey-* “to run, flow,” but also “to scratch, tear, cut”. This is the same *rey* as in another famous text attributed to Heraclitus: *panta rhei*, “all things flow” (Kahn 1979, 4). Interestingly, the entry in Etymology on Line continues by mentioning an implicit notion of companion and common in rival, precisely by sharing the same brook:

‘rival’ comes from the Latin *rivalis* “a rival, adversary in love; neighbor,” originally, “of the same brook,” from *rivus* “brook” (from PIE root \**rei-* “to run, flow”). “One who is in pursuit of the same object as another.” The sense evolution seems to be based on the competitiveness of neighbors: “one who uses the same stream,” or “one on the opposite side of the stream.” A secondary sense in Latin and sometimes in English was “associate, companion in duty,” from the notion of “one having a common right or privilege with another.”

The potential of paradox has infused rivers and rivals from early onwards.

Where rivers had been anchors of civilization since ancient times, they became backgrounded in the era of modernity, specifically in the industrial era (Klaver 2012, 15–19). Polluted, diverted, and dammed, rivers “disappeared,” literally paved over or dried up because of impoundments, or relegated to the unsavory side of town. Once the backbones of towns, they became backsides: the unhealthy and unsafe zones, poor people’s areas, harbors, dumping grounds, sites of water on fire, as the Cuyahoga River, and became

backgrounded in the cultural imagination (Klaver 2012, 2014a). In the second half of the twentieth century, a shift in mentality emerged with the rise of an environmental movement, culminating in growing environmental legislation, including the 1972 Clean Water Act. These developments facilitated a *re*-newed foregrounding of rivers in city planning. Rivers meandered back into the cultural imagination (Klaver 2013; Klaver 2014b).

Climate change-driven floods and droughts in the twenty-first century have put water back on the map in bold. The cultural realm has been inundated with water: a flood of water-related books, advertisements, brand names, real estate ventures, art projects, and movies, including a James Bond film, *Quantum of Solace* (Broccoli et al. 2009), and *Western* (Grisebach 2018), a moving film about the cross-cultural troubles of a group of German construction workers building a hydroelectric power plant in a remote river in the Bulgarian mountainous country side. Water has even streamed into the stock market: water stocks—as in infrastructure projects, desalination plants, and bottled water companies—have soared. Whereas in the course of the twentieth century, in the so-called developed world, water became backgrounded, often invisible in its infrastructural existence, it has come back with a vengeance and has become a solid part of our social-political, economic world and our cultural imagination. Many cities in the industrial world are designing projects to *re*-connect to “their” river. This bespeaks a shift in what I call

environmental imagination: a socially, culturally, and environmentally *re*-valuing of rivers (Klaver 2013; Klaver 2014a). River-reconnection projects are often a real estate and chamber of commerce driven process, and it is especially in this context that a right to the river as commons is called for to counter the injustices of gentrification, commodification, homogenization, and surveillance (Kibel 2007, Klaver 2018a).

In the following section, I explore the process of reconnecting to the river as a meandering movement, a movement of the *again* and the *re*-. I first trace the value shifts in the notion of meandering and *re*-connect meandering to its river of origin, the Meander River in Anatolia, the Asian part of Turkey. I then sketch a brief example of a contemporary case: the City of Los Angeles’ project of *re*-vitalizing of the Los Angeles River. I show how in the *re*-conceptualization of the Los Angeles River, as well as in its realization, meandering abounds, as does the prefix *re*-.

How do we *re*-consider our situation and *re*-imagine our future? How do we facilitate a change in mentality and foster an environmental imagination? I argue that the prefatory syllable *re*-embodies a crucial catalyzer: *re*-think, *re*-connect, *re*-build, *re*-configure. The prefix *re*- conveys the creative capacity of meandering, the on-going activity of beginning and renewing. It reflects the potential trajectory from biocultural homogenization to biocultural conservation.

## Meandering

Meandering refers to the sinuous movement of a river flowing through—hence creating—a landscape. Because of the complexity of this sinuosity, meandering also stands as a symbol for non-deterministic systems. Furthermore, meandering has a deep past and is etymologically rooted in

an actual river, the Meander or Maeander—now Büyük Menderes—River in Anatolia, Turkey.

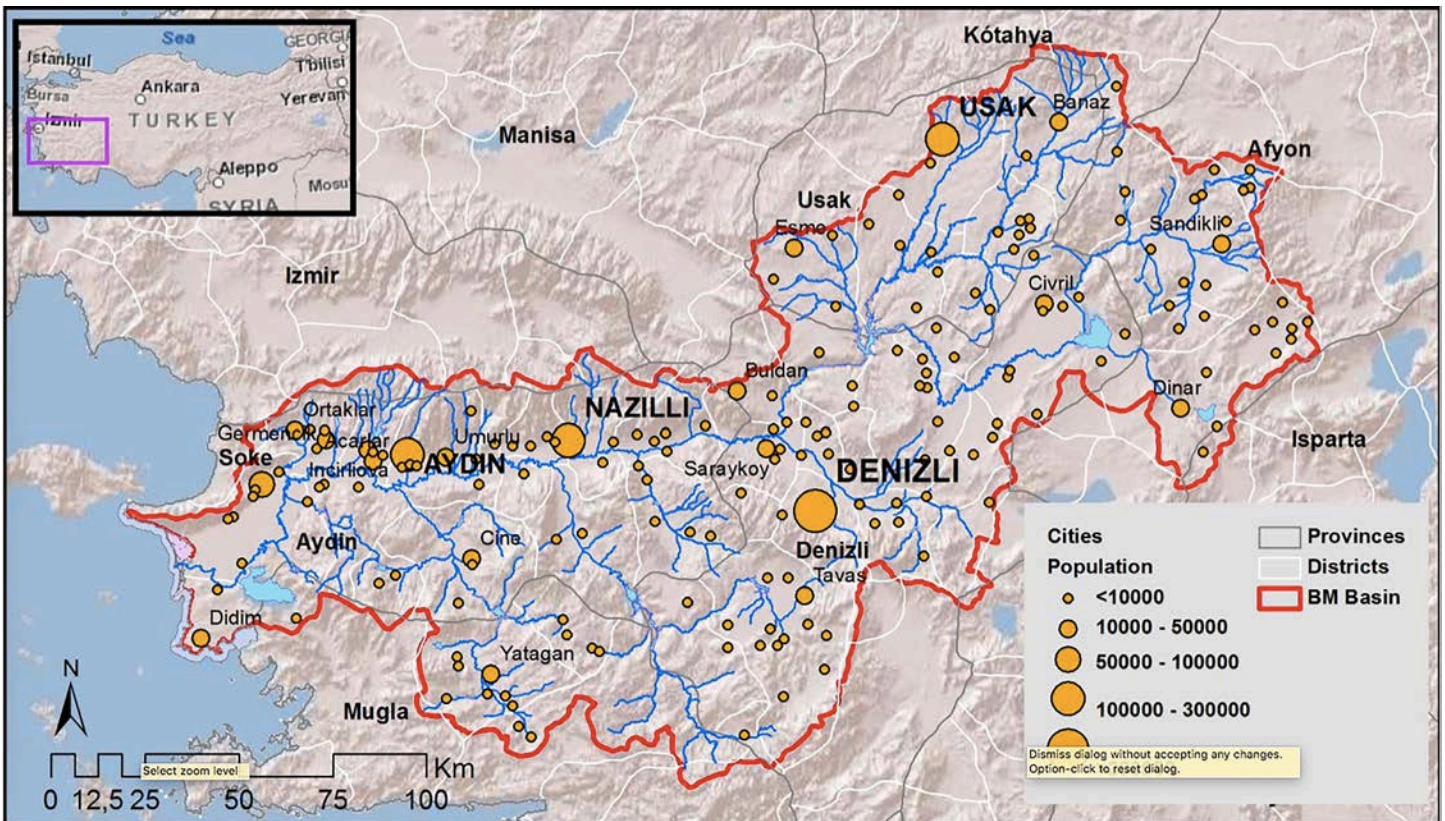
In a meandering of history, the Meander River played major roles in antiquity and then all but disappeared from the cultural imagination (Klaver 2014b; 2016). From early modernity

onward, meanders were engineered away to facilitate modern developments, such as commercial river transportation, property boundary determinations, and city planning. Rivers were stratified and meandering acquired a negative connotation. Linearity has been the privileged paradigm of progress and its leading model of efficiency; its concomitant mindset has been goal-oriented or teleological. Meandering, convoluted and seemingly undirected, is seen as not just the opposite of efficiency, but as being in its way, synonymous with aimless wandering, ambling along a winding path, and rambling through long-winded arguments.

In the course of the second half of the twentieth century, non-linear systems had become widely accepted in the sciences—physics, mathematics, and engineering. Complexity, chaos theory, and non-deterministic, non-linear modeling had become the state of the art in many fields, including the study of behavior of large-scale natural or

social systems in ecology, economy, and politics. [2] Analyses of both practices and systems highlight the importance of field-dependency, of a larger context. These dynamics and an increasingly complex society in terms of media and globalization led to an acceptance of complexity in the cultural imagination and a re-valuation of meandering (Klaver 2014b; 2016).

Re-valuing meandering has a train of effects on a variety of concepts and practices. Meandering as a metaphor for a different sort of thinking is founded in and summarizes the non-deterministic models used in many fields of science that were once the hallmark of linear, positivist thinking. Meandering allows for ambiguity and hybridity, for that which cannot easily be measured, which does not want to be measured, or determined in scheduled time tables. In that sense, meandering makes room for a thinking in terms of spheres, including the notion of riversphere, which covers the less quantifiable



*Büyük Menderes river basin and its main cities. Source: Handbook of monitoring in the Büyük Menderes River Basin. 2015. p. 9.*

multi-dimensional aspects of rivers. Meandering proceeds covering more ground, percolating into deeper depths, listening to more voices, foregrounding the specificity of being what it is when and where it is observed. Meandering makes room for the slow and for the workings of the material realm not ruled by strict structures. It facilitates a slow ontology, a slow epistemology and a slow ethics. Taking time to be, to learn, to know, to judge.

The activity of meandering can be characterized as a process of sedimentation and reactivation, which is a slower process than water running through a concrete channel. However, speed from A to B is not necessarily the only mark of efficiency. Meandering takes more factors into consideration, and therefore is able to respond with more versatility and from a broader set of perspectives. Meandering facilitates a different way of thinking about efficiency, acknowledging that it might be more efficient in the long term to take more time and explore possibilities, just as a river does when it meanders through a basin. More than control, exploration drives innovation. Meandering as a method, as a mental strategy, privileges exploration; it is a messy process, learning from mistakes, and following contingent relations. Many human practices develop in sinuous ways: learning through failing, honing a skill, building experience, facing unexpected challenges, starting anew. Meandering foregrounds the searching in the notion of re-search. Meandering invokes a model of engineering in terms of ingenuity, a bricolage and tinkering that acknowledges and interacts with various kinds of knowledge and expertise, that is capable of adjusting itself to local situations and demands.

Meandering holds much in common with *mêtis*, a term describing practical, even cunning, intelligence in ancient Greek culture.[3] *Mêtis* stands for resourcefulness, practical effectiveness and experiential wisdom. Homer's Odysseus is *polymêtis*—experienced, crafty, wily, and cunning.

Meandering invokes, elucidates, and hints at a different imagination, another mindset, a new epistemological and ontological model, and a cultural and political framework that diversifies what counts as expertise, knowledge, politics, progress, and efficiency. Meandering privileges on-going political deliberation over simple analyses or reductionist geo-political frameworks. It bespeaks the social-political necessity of taking time to explore terrains, to elucidate attributes, relations, problems, and solutions, as a gateway to new constructs of imagination, to a capacity to aspire (Appadurai 2004).

The movement of meandering echoes an ongoing beginning and reveals how beginning works. Beginning does not take place in a vacuum, is not *a creatio ex nihilo*, but is always building on past experience, which can also entail a break with this experience. The emergence and fading of the Meander River in the cultural imagination can itself be seen as a meandering: an appearance and disappearance of the very river that left its indelible mark on human culture by giving its name to the process in which it disappeared again. The paradoxical and self-referential character intensifies the complexity of the process.

The complexities of fluvial geomorphology provide another spatial metaphor in what is known as an anastomosing stream (from the Greek to “recreate a mouth”). This is a form of braided channel, found on the Upper Mississippi and other “low energy” streams, that branches out from itself and then reconnects with itself, thus dividing and rejoining, both feeding and being fed by itself. The multiplicity of flows, channels, and interconnections suggests other ways in which our thought and communities can draw on potamology for insight.[4]

I now make a Heraclitean move, looking to the past to envision the near future—looking to the history of the Meander River to see the emergent meandering way of thinking.

# The Meander River

The River Meander (Anatolia, Turkey) once formed a mercantile and military conduit between Europe, North Africa, and Asia. Herodotus mentions the Meander's winding ways and Strabo has given us the meaning of meandering as wandering. The earliest mentions of the Meander are found in Homer and Hesiod between approximately 750 and 650 BCE, in which the Meander region is portrayed as rather backwards.

Not long thereafter, beginning in 600 BCE, the Greeks settled the Ionian Coast, including the

Meander Delta. The Meander valley became the vital trading route between the Mediterranean and Asia and emerged as a region of high cultural significance.

We might call this the first meandering of the Meander River in the cultural imagination. From a "rural backwater" to the most precious gateway to the east: "vast caravans of wood, wheat and spices, marble and ivory" followed its course (Seal 2012, 11–12). Trade and armies traversed the basin. The city at the high headwaters of



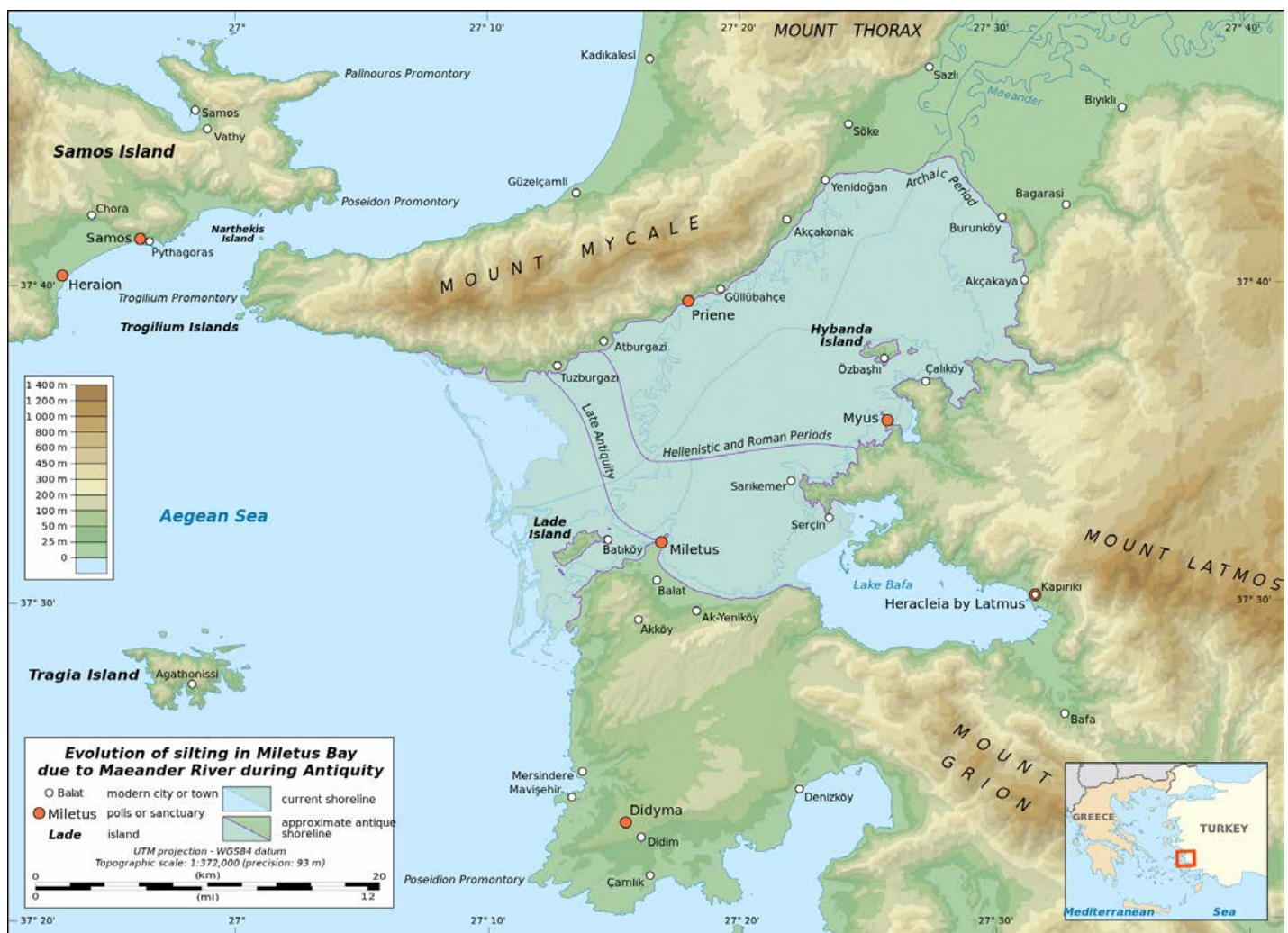
M. Pouqueville, "Milet et cours du Meandre," (Miletus and the course of the Meander) Paris: Firmin Didot frères, 1835. Personal copy of lithograph.

the Meander River, Dinar (Celaenae in the fifth century BCE), was of strategic importance: its pass connected East and West. Xerxes' Persians headed west in 481 BCE to conquer the Greeks; 150 years later Alexander the Great headed east from Macedonia to conquer the Persians. These classic power shifts between the East and the West kept meandering along the river that gave the process the name.

Near the Meander's mouth on the Aegean Sea was the prosperous port of Miletus. In the sixth and fifth centuries BCE, it was a cultural center, booming and bustling with celebrated musicians, poets, engineers, mapmakers, and philosophers, such as Thales, Anaximander, and Anaximenes. Aristotle called Thales of Miletus the first Greek philosopher. Thales considered water to be the

beginning, an originating and guiding principle or *archê*. Heraclitus was a native of Ephesus, a prominent city close to Miletus.

The Meander River had created a fertile valley. However, in another meandering twist of history, the very same agricultural development that made the region prosper and provided food for military and mercantile caravans, enhanced erosion and silt formation in the basin, and the once so powerful harbor city Miletus became a landlocked town. Over the centuries, the Miletus Bay silted up with alluvial deposits from the very river that nurtured its importance. The economy of the once-prominent harbor city collapsed. Nowadays, the ruins of the city lie some 10 kilometers from the Aegean Sea.



Miletus Bay silting evolution map, Eric Gaba, 2009, (CC BY-SA 3.0).



*Winged goddess thought to be Metis, in a scene depicting the birth of Athena. Detail on black-figure amphora from 550-525 BC in the collection of the Louvre. Photographer Marie-Lan Nguyen. (CC BY 3.0).*

# Meander and Metis

The very twisting and wandering character for which meandering became so well-known bespeaks a way of thinking that has been long ignored, belittled, even considered counter-productive, precisely because it connotes complexity and multiplicity instead of linearity and unity. In its polymorph character, adjusting itself to the circumstances, meandering is structurally comparable to the ancient Greek notion of applied or real-world and practice-based intelligence, or *mêtis*.

In Greek mythology, Meander and Metis (*Mῆτις*) were brother and sister. According to Hesiod, Thetis and Oceanus had three thousand sons, river-gods or *Potamoi*, and three thousand daughters, the *Oceanid*, each of them patroness for a specific spring, river, or lake. Only the foremost were mentioned by name: among the sons, Meander, among the daughters, Metis.

Metis was, initially, an important deity, the first spouse of Zeus, and represented wisdom, skill, craft, and cunning—a highly praised combination. However, Zeus fearing her powers and her offspring, swallowed her, but she had already conceived Athena, who was born fully armed from Zeus' forehead. Metis faded from Greek mythology, eclipsed by her daughter, Athena, goddess of wisdom. Metis symbolized practical intelligence in politics, practice-based knowledge in military art and medicine, the skills of the artisan crafts; all these forms of experiential wisdom, rooted profoundly in the intimacy of specificity, were called *mêtis*.

In *Cunning Intelligence in Greek Culture and Society*, Detienne and Vernant argue that *mêtis* escapes simple definition—it “always appears more or less below the surface, immersed as it were in practical operations” (1978, 3). Its way of knowing, its kind of intelligence and “its field

of application is the world of movement, of multiplicity and of ambiguity. It bears on fluid situations which are constantly changing and which at every moment combine contrary features and forces that are opposed to each other” (20).

According to Detienne and Vernant, *mêtis* is “at the heart of the Greek mental world in the interplay of social and intellectual customs where its influence is sometimes all-pervasive” (1978, 3). However, despite its pervasiveness, *mêtis* is never explicitly thematized or analyzed in ancient Greek philosophical texts. While there are many treatises about logic, there are none about *mêtis*. The intellectual world of classic Greek philosophy, in contrast to its everyday mental world, was a dualistic world with a dichotomy between being and becoming, the intelligible and sensible, the unchanging one and changing multiple. In this framework of thought there was no place for *mêtis*, which “is characterised precisely by the way it operates by continuously oscillating between two opposite poles” (5). The mode of thinking of *mêtis* does resonate profoundly with Pre-Socratic philosophers, specifically with Heraclitus.

James Scott emphasized in his seminal work, *Seeing Like a State*, the significance of *mêtis* for the social sciences and fields such as geography and architecture. He invokes the term *mêtis* “to conceptualize the nature of practical knowledge and to contrast it with more formal, deductive, epistemic knowledge” (1998, 6).

There may be some rules of thumb, but there can be no blueprints or battle plans drawn up in advance; the numerous unknowns in the equation make a one-step solution unimaginable. In more technical language, such goals can only be approached by a stochastic process of successive approximations, trial and error, experiment, and learning through



experience. The kind of knowledge required in such endeavors is not deductive knowledge from first principles but rather what Greeks of the classical period called *mētis* (...). Usually translated, inadequately, as “cunning,” *mētis* is better understood as the kind of knowledge that can be acquired only by long practice at similar but rarely identical tasks, which requires constant adaptation to changing circumstances. (Scott 1998, 177–178)

Scott describes how this kind of knowledge had become backgrounded in modernity with rather devastating consequences. “The utilitarian commercial and fiscal logic that led to geometric, mono-cropped, same-age forests also led to severe ecological damage” (1998, 309). In a twenty-first century trajectory from homogenization to biocultural conservation the importance of *mētis* is re-surfacing again; this time, as I argue, in consort with meandering.

The meander confounded early lawyers concerned with boundaries and scientists concerned with the mechanisms of meandering streams. Meander symbolized irregularity, complexity, ambiguity, and instability. In the latter part of the twentieth century, precisely these “meandering” qualities brought out the value of multiple perspectives in arts and sciences; the weak ontology of becoming became as valuable as the traditionally more privileged strong ontology of being; the inductive, analogical, and emergent, as valuable as control and generalizability (O’Connor, Copeland, and Kearns 2003, 99). The understanding of probability and complexity provided new forms of explanation and new ways

to operate even within fields long founded on “ideal” characteristics and laws. The meander came to be seen as an irregular waveform, at once subject to and generating random processes and forms.

Various characterizations of ingenuity and of emergent and analogical thinking bear deep resemblance to the *mētis* of antiquity. Dreyfus and Dreyfus speak of *expertise* in terms of “intuition [that] is the product of deep situational involvement and recognition of similarity” and note: “how experience-based holistic recognition of similarity produces deep situational understanding” (1986, 29, 32). Similar concepts characterize the notion of ingenuity and engineering design: explicitly pragmatic, contingent, visual in character, satisficing, messy, holistic, whimsical, learning from failure (O’Connor, Copeland, and Kearns 2003, 104).

Hapgood describes the first phase of engineering design as a “metaphorical traversal through solution space,” in which “failure, imagination, and stuckness” are at play. The traversal and design process is “idiographic and unpredictable” and often beset with “painful trials or iterations.” For Hapgood, the engineer is a “tinkerer who engages in activities within an artistic and subjective context” (1993, 96). O’Connor and Wyatt use the term “thinkering” to blend Hapgood’s tinkering together with Dreyfus’s deep situational involvement into “engineering discovery by doing” (2004, 12).

The efficiency of meandering lies in its affordance of the time and broader horizon necessary for “thinkering.”

## Re-meandering

Re-meandering has become a popular practice in ecological restoration: meanders are introduced even in places where there never were meanders.

Rivers are resurfacing in the public imagination as places to congregate, and as cultural and ecological corridors, creating a cultural

rejuvenation around urban renewal projects. Also in rural areas, river restoration is underway: the re-meandering of watercourses and restoring of floodplains are being carried out—sometimes even by the same engineering firms that straightened the waterways in the early or mid-twentieth century. New adaptive management regimes are seeking to work *with*, not against, rivers.

Meandering is dependent on the complex interaction of many material vectors. It is a symbol for how power operates in the everyday, lateral traversing, picking up material and depositing, re-activating in the process. Meandering stands for an ethics of adjustment, a politics of engagement, enabling deliberation, a sense of experiment: tinkering, thinkering, emergent, and

transient. Meander brings the social, political, technological, and natural together in an ongoing dynamic. The Law of the Meander is not the straight line but the sinuous back and forth, symbolized linguistically by the prefix *re-*, the notion of the again and again, the experience one gets in *mêtis*, the exploration through wandering, the essay in Montaigne’s original sense of trial and attempt.

The Meander River no longer functions as a Mediterranean thoroughfare, but the notion of meandering has re-emerged as valuable. Meandering is not a symbol for closure but one of ongoing change and exchange, of identities that **shift over time**.

## There It Is

The narrative arc of the Los Angeles River provides an exemplary, and at the same time cautionary, tale of the intertwinement of re-rivering, meandering, and beginning anew again and again (Klaver and Frith 2014).[5]

As urban planner and writer John Arroyo emphasizes in his thesis, “Culture in Concrete: Art and the Re-imagination of the Los Angeles River as Civic Space,” “artists have taken to the River as a creative venue. Their actions have re-defined the River and have allowed us (and impel us) to re-imagine the River as the civic space” (2010, 3). They have flourished in “the un-designed, unplanned, and the spontaneous nature of the River space” independent of any formal urban planning or intervention (3).

River revitalization plans often come with gentrification and a complex re-drawing of the public and private: when the old abandoned, neglected, polluted, dangerous riverside becomes “beautified,” poor communities all too often are elbowed out to make place for a new upper middle-class

population. As Kibel states succinctly: with any of these projects one needs to “consider the questions of who makes decisions about our urban rivers (...) and who ultimately benefits from or is burdened by these decisions” (2007, 15). The danger of commodification is a sanitized and controlled space—lacking the conceptual and social “messiness” of poor neighborhoods or abandoned and waste places, which function as meandering space. Foucault calls these places “heterotopias:” “unique, non-traditional, and differentiated ‘other places’ where the constraints of typical regulations and rules were suspended” and which therefore entice the imagination, spontaneous reactions, and transformative powers (Arroyo 2010, 66).

It is too soon, yet, to say which ways the re-imagined Los Angeles River will flow. Price sums it up succinctly: “the revitalized river will be a product of continuous compromise and negotiation” (2008, 552). In fact, this is the definition of the politics of an engaged community that fosters the ongoing deliberative process of civic life,



*The Forsaken River. After it was channelized in the 1950s, the Los Angeles River looked more like a “deserted freeway” than a river. Unable to access the river, many Angelenos grew up unaware that Los Angeles had a river at all. Image courtesy of Irene J. Klaver, 2006.*

## ISSUE ELEVEN : SUMMER 2018

engaging in ongoing debate, meandering like a river, taking time to examine ramifications, to explore various trajectories, to also hear the voices of the less powerful and take their concerns seriously in order to create the river as a common space.

*See the full version of the brochure image [here](#).*

In all its hybridity, the Los Angeles River crosses boundaries of race, class, and human and physical geography, concrete and earth. As a re-meandering but still mainly concrete river, it is a symbol of a new twenty-first-century paradigm of hybridity in water management

and environmentalism. Mulholland's dedication speech for the aqueduct resonates in the background "There it is..." this time without the entitled imperative of the twentieth century, "take it!"

In conclusion, I re-turn to Heraclitus to summarize our meandering through human relations to rivers. Returning to the two Heraclitus fragments—"as they step into the same rivers, other and still other waters flow upon them" and "one cannot step twice into the same river" (Kahn 1979, 52–3)—we can say the philosopher reminds us that paradoxes are not necessarily confounding or useless. Close examination and



*Aerial view of the Los Angeles River adjacent to a meandering highway. Image courtesy of Brian C. O'Connor, 2014.*

shifting perspectives show us we can step into the same location, the same coordinates in a three-dimensional space, and we would at different times encounter different water, different sedimentary material being carried and being deposited, even different materials in different formations on the river bottom. Likewise, components of the riversphere will have changed, some nearly imperceptibly and some beyond recognition. While we are not able to return any river or system of rivers to exactly some former configuration, the words of Heraclitus can help to remind us that we might take steps that reduce homogenization, that enable distinctly “other and still other waters” to flow through our riverspheres.

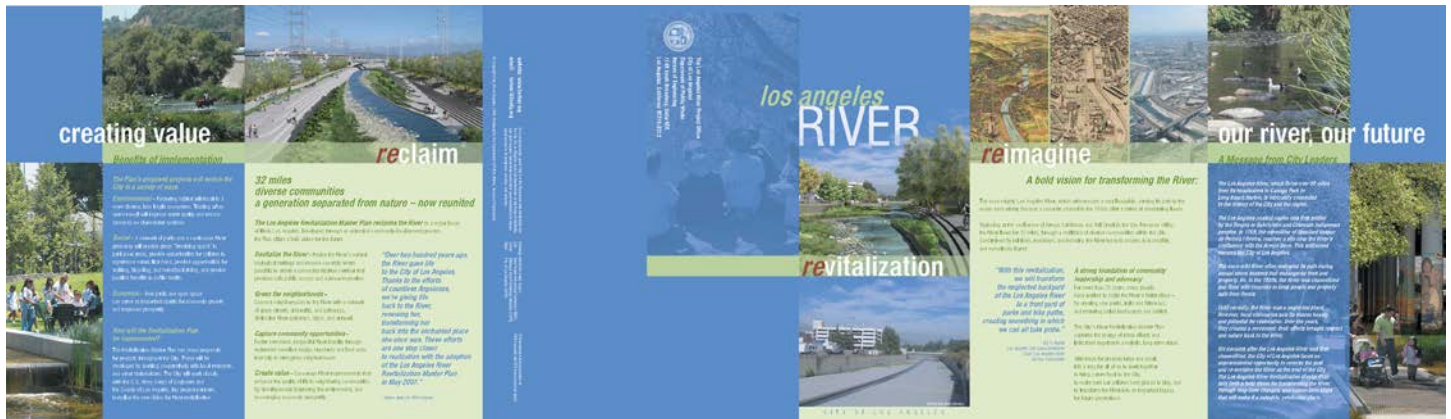
The story-arc of the Meander River gives us a vivid long view of a river in relation to human culture: giving passage to great armies, bearing witness to the beginnings of philosophy, confounding lawyers and geographers, and all but disappearing from memory. The story-arc of the Los Angeles River enables us to re-frame our relationships with our rivers, to revitalize the rivers and ourselves. Such stories re-value the practice of mētis and meander alike and, with the vigor of renewed imagination, re-rivered rivers meander back as experiential and shared places and as powerful metaphors for thinking.

## Acknowledgement

Deep-felt thanks to Brian C. O’Connor for support, valuable suggestions, photographic material, and close readings.

## Footnotes

[1] This piece builds upon and is a continuation of earlier writings on meandering. At every turn, I set out to make the concept of meandering more robust as a tool for understanding the various dynamics of our relations to rivers. See Klaver 2014b, 2016, 2017, 2018a, and 2018b.



*Re-Imagining the Los Angeles River. In the 1980s, community activists began to re-imagine the Los Angeles River, urging city officials and fellow Angelenos to reconnect with the river and to reclaim it as a place of community and revitalization. Their efforts culminated in 2007 when the City of Los Angeles issued the Los Angeles River Revitalization Master Plan. Above, a promotional brochure explains the Plan’s “bold vision for transforming the river.” Source: Los Angeles River Project, City of Los Angeles, Department of Public Works, Bureau of Engineering, 2008.*

[2] Any substantial discussion of complexity and non-deterministic systems is outside the scope of this paper. Stating it simply: small variations in values hidden by approximations used in the solution of linear equations for non-linear systems can result in large differences in results; interactions between multiple variables, especially when initial conditions are not known, can be unpredictable; and, as Waldrop notes, systems with numerous independent agents can have “a richness of interactions that allows the system as a whole to undergo spontaneous self-organization.” For an in-depth introduction to the notions of complexity and non-deterministic systems see: Gaddis 2004, Barad 2007, Waldrop 2008.

[3] This is not to be confused with the term *Métis*, which refers to a group of peoples of mixed First Nations’ and colonial-era Euro-American ancestry, from the fur trade and afterward, especially on the Canadian and U.S. Plains. They are recognized as one of Canada’s aboriginal peoples with their own distinct Métis culture. The term is derived from French and Latin words for ‘mixed’ (also found in *mestizo*). All of these forms are etymologically related to the Greek Metis.

[4] I want to thank the *Open Rivers* reader for suggesting this paragraph.

[5] This part is based upon earlier writing with J. Aaron Frith on the history of water supply in Los Angeles. For a more extensive account of the re-connecting of Los Angeles to its river, see Gumprecht 1999, Gottlieb and Misako 2007, Price 2008, Klaver and Frith 2014.

## Bibliography

Amin, Ash, Doreen Massey, and Nigel Thrift. 2000. *Cities for the Many Not the Few*. Bristol, United Kingdom: Policy Press.

Anand, Nikhil. 2017. *Hydraulic City: Water and the Infrastructures of Citizenship in Mumbai*. Durham, North Carolina: Duke University Press.

Appadurai, Arjun. 2004. “The Capacity to Aspire: Culture and the Terms of Recognition.” In *Culture and Public Action*, edited by Vijayendra Rao and Michael Walton, 59–84. Stanford, California: Stanford University Press.

Arroyo, John. 2010. “Culture In Concrete: Art and the Re-imagination of the Los Angeles River as Civic Space.” M.C.P. thesis, Massachusetts Institute of Technology. Accessed November 16, 2015. [www.arroyoseco.org/arroyojcthesis.pdf](http://www.arroyoseco.org/arroyojcthesis.pdf).

Barad, Karen Michelle. 2007. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham, North Carolina: Duke University Press.

Böhme, Gernot. 1993. “Atmosphere as the Fundamental Concept of a New Aesthetics.” *Thesis Eleven* (36): 113–126.

Broccoli, Barbara, Michael G. Wilson, Paul Haggis, Neal Purvis, Robert Wade. 2009. *Quantum of Solace*. DVD. Directed by Marc Forster. Beverly Hills, CA: 20th Century Fox Home Entertainment.

Detienne, Marcel, and Jean-Pierre Vernant. 1978. *Cunning Intelligence in Greek Culture and Society*. Translated by Janet Lloyd. Chicago: University of Chicago Press.

- Dreyfus, Hubert L., and Stuart E. Dreyfus. 1986. *Mind over Machine, The Power of Human Intuition and Expertise in the Era of the Computer*. Oxford, United Kingdom: Basil Blackwell.
- Gaddis, John Lewis. 2004. *The Landscape of History: How Historians Map the Past*. Oxford: Oxford University Press.
- Gottlieb, Robert, and Andrea Misako Azuma. 2007. "Bankside Los Angeles." In *Rivertown: Rethinking Urban Rivers*, edited by Paul Stanton Kibel, 23–46. Cambridge, Massachusetts: MIT Press.
- Grisebach, Valeska, Bernhard Keller. *Western*. DVD. Directed by Valeska Grisebach. good!movies, 2018.
- Gumprecht, Blake. 1999. *The Los Angeles River: Its Life, Death and Possible Rebirth*. Baltimore: Johns Hopkins University Press.
- Handbook of Monitoring in the Büyük Menderes River Basin. 2015. TR2009/0327.02-02/001- Technical Assistance for Capacity Building on Water Quality Monitoring. National Programme for Turkey 2009. Accessed June 28, 2018. [http://www.suyonetimi.gov.tr/Libraries/su/TAWQM\\_20150414\\_Handbook\\_EN\\_3.sflb.ashx](http://www.suyonetimi.gov.tr/Libraries/su/TAWQM_20150414_Handbook_EN_3.sflb.ashx).
- Hapgood, Fred. 1993. *Up the Infinite Corridor: MIT and the Technical Imagination*. Reading, Massachusetts: Addison-Wesley Publishing Company.
- Harvey, David. 2008. "The Right to the City." *New Left Review* II (53): 23–40.
- Johnston, Barbara Rose. 2012. "Water, Culture, Power: Hydrodevelopment Dynamics." In *Water, Cultural Diversity & Global Environmental Change: Emerging Trends, Sustainable Futures?*, edited by Barbara Rose Johnston, Lisa Hiwasaki, Irene J. Klaver, A. Ramos Castillo, and Veronica Strang, 295–318. The Hague: UNESCO International Hydrological Program.
- Kahn, Charles H. 1979. *The Art and Thought of Heraclitus*. Cambridge, United Kingdom: Cambridge University Press.
- Kibel, Paul Stanton. 2007. "Bankside Urban: An Introduction." In *Rivertown: Rethinking Urban Rivers*, edited by Paul Stanton Kibel, 1–22. Cambridge, Massachusetts: The MIT Press.
- Klaver, Irene J. 2012. "Placing Water and Culture." In *Water, Cultural Diversity & Global Environmental Change: Emerging Trends, Sustainable Futures?*, edited by Barbara Rose Johnston, Lisa Hiwasaki, Irene J. Klaver, A. Ramos Castillo, and Veronica Strang, 9–29. The Hague: UNESCO International Hydrological Program.
- . 2013. "Environment Imagination Situation." In *Linking Ecology And Ethics For A Changing World: Values, Philosophy, and Action*, edited by Ricardo Rozzi, Steward T. Pickett, Clare Palmer, Juan J. Armesto, and J. Baird Callicott, 85–105. Dordrecht, Netherlands: Springer Press.

———. 2014a. “Landscapes of Environmental Imagination: Ranging from NASA and Cuyahoga Images to Kiefer and O’Keeffe Paintings.” In *Environmental Aesthetics: Crossing Divides and Breaking Ground*, edited by Martin Drenthen and Jozef Keulartz, 135–153. New York: Fordham University Press.

———. 2014b. “Meander(ing) Multiplicity.” In *Water Scarcity, Security and Democracy: A Mediterranean Mosaic*, edited by Francesca de Châtel, Gail Holst-Warhaft, and Tammo Steenhuis, 36–46. Ithaca, New York: Cornell University Press, the Atkinson Center for a Sustainable Future, and Global Water Partnership-Mediterranean (GWP-Med).

———. 2016. “Re-Rivering Environmental Imagination: Meander Movement and Merleau-Ponty.” In *Nature and Experience: Phenomenological Approaches to the Environment*, edited by Bryan E. Bannon. London: Rowman and Littlefield International Limited. 113–127.

———. 2017. “Indeterminacy in Place: Rivers as Bridge and Meandering as Metaphor.” In *Phenomenology and Place*, edited by Janet Donohoe, 209–225. London: Rowman and Littlefield International Limited.

———. 2018a. “Engaging the Water Monster of Amsterdam: Meandering toward a Fair Urban Riversphere.” Forthcoming in *The Wonder of Water: Lived Experience, Policy and Practice*, edited by Ingrid Leman Stefanovic. Toronto: University of Toronto Press.

———. 2018b. “Re-Claiming Rivers from Homogenization: Meandering and Riverspheres.” Forthcoming in *From Biocultural Homogenization to Biocultural Conservation*, edited by Ricardo Rozzi, R. May, T. Chapin, M. Gavin, I. Klaver, F. Massardo, M. Núñez, A. Pauchard, and D. Simberloff. Dordrecht, Netherlands: Springer Press.

Klaver, Irene J., and J. Aaron Frith. 2014. “A History of Los Angeles’s Water Supply: Towards Re-imagining the Los Angeles River.” In *A History of Water, Series III, Vol. 1: Water and Urbanization*, edited by Terje Tvedt and Terje Oestigaard, 520–549. London: I.B. Tauris.

Law, John, and John Urry. 2005. “Enacting the Social.” *Economy and Society* 33(3): 390–410.

Mulholland, Catherine. 2000. *William Mulholland and the Rise of Los Angeles*. Berkeley: University of California Press.

O’Connor, Brian, Jud H. Copeland, and Jodi L. Kearns. 2003. *Hunting and Gathering on the Information Savanna*. Lanham, Maryland: Scarecrow Press.

O’Connor, Brian, and Roger B. Wyatt. 2004. *Photo Provocations, Thinking in, With, and About Photographs*. Lanham, Maryland: Scarecrow Press.

Online Etymology Dictionary. “Rival.” Etymonline.com. Accessed July 20, 2018. <https://www.etymonline.com/word/rival>.

Price, Jenny. 2008. “Remaking American Environmentalism: On the Banks of the L.A. River.” *Environmental History*, 13: 536–555.



## ISSUE ELEVEN : SUMMER 2018

Richter, Brian D., Sandra Postel, Carmen Revenga, Thayer Scudder, Bernhard Lehner, Allegra Churchill, and Morgan Chow. 2010. "Lost in Development's Shadow: The Downstream Human Consequences of Dams." *Water Alternatives* 3(2): 14–42.

Scott James C. 1998. *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven: Yale University Press.

Seal, Jeremy. 2012. *Meander: East to West, Indirectly, Along a Turkish River*. New York: Bloomsbury USA.

United Nations, Department of Economic and Social Affairs, Population Division (UN DESA). 2014. *World Urbanization Prospects: The 2014 Revision, Highlights (ST/ESA/SER.A/352)*. New York: United Nations. Accessed August 10, 2016. <https://esa.un.org/unpd/wup/Publications/Files/WUP2014-Highlights.pdf/>.

Waldrop, M. Mitchell. 2008. *Complexity: The Emerging Science at the Edge of Order and Chaos*. New York: Simon & Schuster Paperbacks.

Wiktionary. "River." Wiktionary.org. Accessed July 20, 2018. <https://en.wiktionary.org/wiki/river>.

World Commission on Dams (WCD). 2000. *Dams and Development: A New Framework for Decision-making*. London: Earthscan Publications. Also available from [https://www.internationalrivers.org/sites/default/files/attached-files/world\\_commission\\_on\\_dams\\_final\\_report.pdf](https://www.internationalrivers.org/sites/default/files/attached-files/world_commission_on_dams_final_report.pdf).

## Recommended Citation

Klaver, Irene J. 2018. "Meandering and Riversphere: The Potential of Paradox ." *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/meandering-and-riversphere-the-potential-of-paradox/>.

## About the Author

Irene J. Klaver is Professor in Philosophy at the University of North Texas and Director of the Philosophy of Water Project. She works at the interface of social-political and cultural dimensions of water, with a special interest in urban rivers. Currently she is finalizing a co-authored book about the Trinity River in North Texas and working on a monograph on Meandering, River Spheres and New Urbanism. Dr. Klaver was Water and Culture Advisor for UNESCO, 2008-2013, and Co-Director of the International Association for Environmental Philosophy, 2010-2014.

FEATURE

# THE SOURCES OF THE NILE AND PARADOXES OF RELIGIOUS WATERS

By Terje Oestigaard

The River Nile has long been a subject of study and veneration.

From the earliest times the Nile has presented problems upon which men have speculated. Two of the most important which have been discussed since the time of Herodotus,

the position of the sources of the Nile and the origin of its annual flood, were solved during the last and at the beginning of the present century.[1]

While these questions were geographical in the nineteenth century, in the preceding centuries



*Timkat, Ethiopia, 2010. Image courtesy of Terje Oestigaard.*

and even millennia they were also religious quests, and the religious dimensions are still fundamental. This article will discuss and compare the qualities of the divine waters in the different water cosmologies at the source of the Blue Nile in Ethiopia and at the source of the White Nile in Uganda. Based on empirical fieldworks and participation in rituals, it will also enable theoretical discussions of the role and function of holy water and how various water cosmologies work in broader cultural and societal contexts, and the relation between river and rain ideologies in different hydrological environments.

Gish Abay, or the source of the Blue Nile in Ethiopia, is seen as the direct outflow of the River Gihon from Paradise. The source is considered to be exceedingly holy and to have a direct link to heaven, which needs to be protected from defilement. In practice, this excludes everyone except the devotees belonging to the Ethiopian Orthodox Church. The historic source of the White Nile in Uganda, on the other hand, has a very different character. The water is not holy, but the forces of the waterfalls testify to the powers the river spirits possess. These river spirits embody particular healers who can solve anything and everything in this and the otherworldly spheres. Since different forms of religious waters can be holy, sacred, and neutral, it is the differences and changing divine powers and consequences that are central in the different water cosmologies, as well as how they have different religious origins or sources defining ritual uses among humans.

*Hydrologically*, a source is the remotest spring or discharge point of a river in terms of ultimate length. Historically, there are sources found in the history of ideas or places where specific historic significance has been ascribed. *Religiously*,

a source can originate at any place along the river's course, but most often it is a fountain, a waterfall, or some subterranean source, which may also be a link in one way or another to flows of cosmos in the celestial realms. Hence, these different types of sources may not coincide, although the source of the Blue Nile in Ethiopia is both a hydrological source (giving the Blue Nile its longest length), a historic source (being a legendary place visited by explorers throughout the centuries), and a religious source (coming from paradise). The source of the White Nile, on the other hand, is primarily the outlet of Lake Victoria and hence a historic source, but it is also a hydrological and religious source in the local cosmology. Lastly, the ultimate sources are the rains falling from the sky directing the attention to the divinities and rainmaking practices (Fig. 1).

Oxford Dictionaries define a paradox as “a seemingly absurd or contradictory statement or proposition which when investigated may prove to be well founded or true.”[2] Water in general and religious water in particular may fit well with such a definition, since water is a unique element in the sense that it is always both *universal* and *particular* at the same time.[3] By comparing religious belief systems associated with the specific waters at these sources—the sources of the Blue and the White Nile, but also the sources in heaven as rain—the aim of this article is to shed new light on how and why various forms of religious waters shape beliefs and rituals. It will also address seeming paradoxes of religious waters, including why it is ritually and religiously acceptable to pollute holy water and why water may have a greater importance in indigenous traditions and cosmologies when it is not holy compared to world religions' consecrated or holy water in rituals and devotional practices.

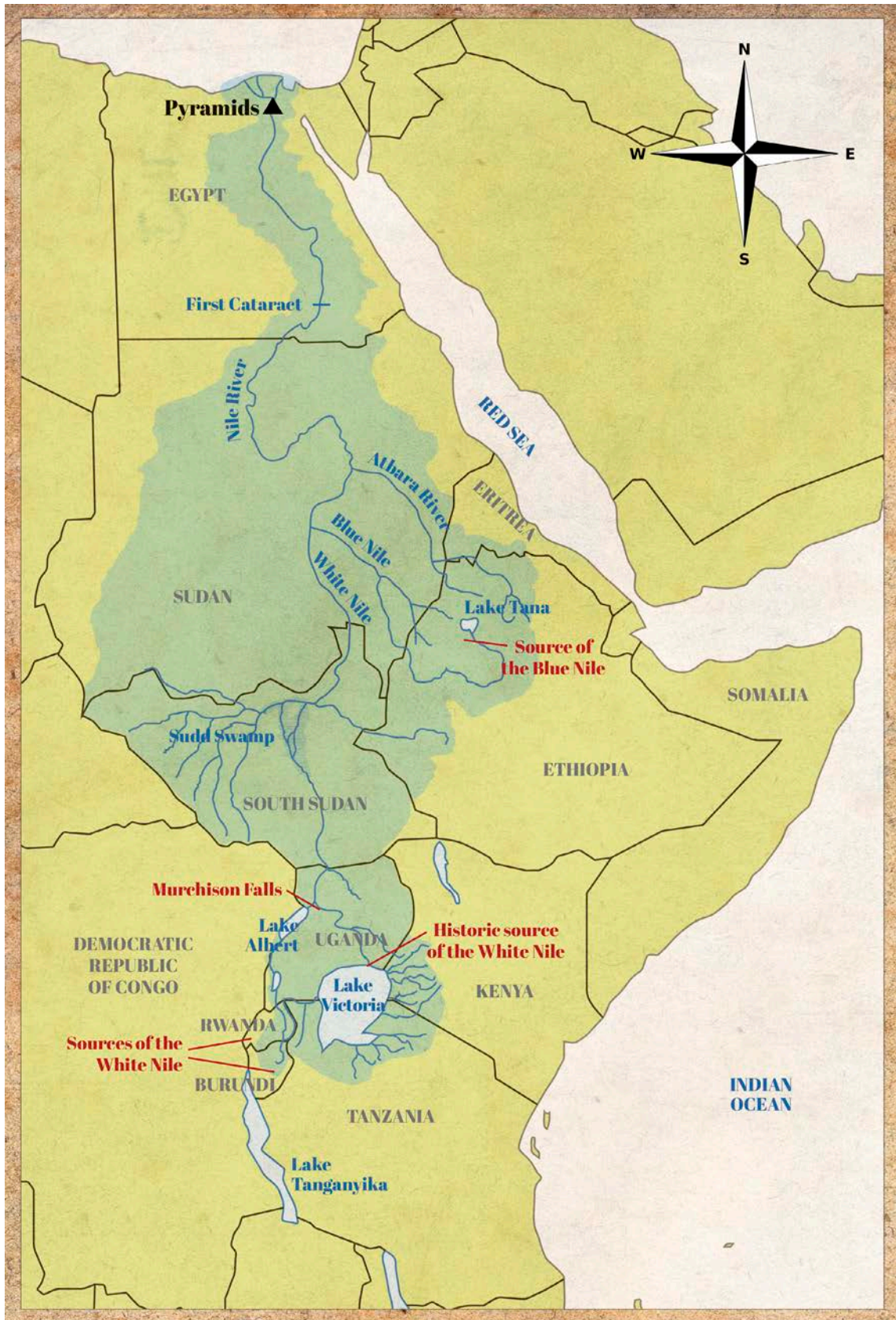


Fig. 1. Map of the religious Nile. Made by Henrik Alfredsson, the Nordic Africa Institute, Uppsala. Used with permission.

# The Divine Sources of the Blue and White Niles

The Gish Abay spring in the Lake Tana region in Ethiopia is believed to be the source of the Blue Nile coming from Paradise. The holiness of Gish Abay has its origin in both Old and New Testament contexts. In Genesis, it is written:

A river watering the garden flowed from Eden; from there it was separated into four

headwaters. The name of the first is the Pishon; it winds through the entire land of Havilah, where there is gold. The name of the second river is the Gihon; it winds through the entire land of Cush. The name of the third river is the Tigris; it runs along the east side of Asshur. And the fourth river is the Euphrates. (Genesis 2:11–14)



*Fig. 2. Gish Abay or the Source of the Blue Nile in Ethiopia. Image courtesy of Terje Oestigaard.*

There is also another mythology giving the name to the very source—Gish Abay. The story is about the introduction of Christianity to this area.

Abune Zerabruk, born at the end of the eighth century AD, was a man of religious character from his early days. According to the legend of the church, the abune (an honorific title given to an Ethiopian Orthodox bishop) received from God the power to cure people of their physical diseases and spiritual sins by using water. Due to political and religious opposition, he was eventually imprisoned for five years by the local king. Before he was taken to jail, he consigned his seven sacred books to the source of the river. He preached for two years after his release, and he came back to the source seven years after he gave the books to the water. At the spring, he prayed devotedly to God and asked him to bring forth the books he had deposited in the water. He called out *Gish*, which means “bring forth,” and like a miracle, the source brought forth the books, which were in splendid condition. Astonished by the miracle, he turned to his old disciple, Aba Zerufael, to behold the miracle. He said *Aba Eyi* in Amharic, which means “Father, look.” Aba Eyi became *Abay*, which is the Ethiopian name for the Blue Nile. Thus, the name of the river and the source come from this divine intervention.[4] After this miracle, the river’s name changed from Gihon to Abay and the river got a masculine character, indicated by the term Aba Eyi, or Father, look. Lobo later wrote that the natives called the Nile Abavi, “that is, the Father of Waters.”[5]

*See the video Holy Water in Ethiopia.*

Being the source directly from heaven, the water is exceedingly holy, and Gish Abay is believed to be the source of both secular and spiritual life (Fig. 2). It is generally believed that people who are baptized or sprinkled with water from the Gihon River are cured of sins, sicknesses, and misfortunes. On behalf of Abune Zerabruk, it is also believed that God bestowed his mercy on up to 70 generations of the descendants of the

devotees who made a pilgrimage to the source, prayed, and used the water in rituals.

If this source is today seen as the holiest of the holy water since it comes from Paradise, it was anything but a heavenly haven in the past. The first European to visit and document the source of the Blue Nile was the Portuguese Jesuit priest Pedro Paez. The date of his visit is variously given as April 21, 1613 or 1615 or 1618.[6] When James Bruce came to the source in November 1770, he referred in particular to the cult of sacrificing oxen: “The Agows of Damot pay divine honour to the Nile; they worship the river, and thousands of cattle have been offered, and still are offered, to the spirit supposed to reside at its source ... all the tribes ... meet annually at the source of the river, to which they sacrifice, calling it by the name of the *God of Peace*.”[7] At the time of Bruce’s visit, the church had established itself at Gish, but the pre-Christian practices and traditions were still alive and present, and it seems that Christianity incorporated what they called “pagan practices” and re-interpreted them in a cosmology fitting the Biblical world and the Bible: the River Gihon coming from Paradise.

The historic source of the White Nile has an opposite history; it was originally interpreted in Biblical terms while it was a fundamental part of the indigenous cosmology among the people in the Busoga Kingdom living along the Nile at the outlet from Lake Victoria in Uganda. The Victoria Nile, or the Nile flowing from Lake Victoria, separates the Buganda Kingdom to the west and the much smaller Busoga Kingdom to the east. The water cosmology discussed here will focus of the beliefs and practices among the Busoga, since the cosmological role of waterfalls and the Nile as a river is most prominent in this kingdom. When coming to the outlet of Lake Victoria on July 28, 1862, the British explorer John Hanning Speke concluded, in his *Journal of the Discovery of the Source of the Nile*: “The expedition had now performed its functions. I saw that old Father

Nile without any doubt rises in the Victoria N'yanza, and, as I had foretold, that lake is the great source of the holy river which cradled the first expounder of our religious belief.”[8] He continued: “I now christened the ‘stones’ Ripon falls ... the N'yanza is the great reservoir that floated Father Moses on his first adventurous sail—the Nile.”[9]

Postcolonial criticism of these Western explorers is important. “It seems absurd to continue to credit European explorers with the ‘discovery’ of African peoples, rivers, lakes, waterfalls, mountains, and creeks,” Nwauwa says, “when Africans themselves knew about the existence of these things.”[10] However, in particular with regard to the source of the White Nile, Western explorers like Speke established religious connections along

the Nile’s flow of water and without external interventions and interpretations the local traditions would not have become part of Christianity or world religions. One hundred fifty years later, a Catholic priest in Uganda made the connection between the source and Christianity’s salvation history even stronger: The River Nile is a history of salvation in Christianity. Moses and all the other Biblical figures like Abraham and Jacob drank of the waters from the Nile, including Jesus with his family. Uganda in general and Busoga in particular have therefore a special role in Christianity and the salvation history. The Nile connects the religious beliefs since, without the waters from Lake Victoria and the historic source of the White Nile identified by Speke, the Biblical history could not have evolved and unfolded in Egypt as it did. Nevertheless, priests emphasized



*Fig. 3. The Source of the White Nile in Uganda and the river spirit Kiyira. Image courtesy of Terje Oestigaard.*

that the water at the source in particular or the Nile in general is not holy. Moreover, while Christianity first came to Uganda in 1877,[11] the traditional water cosmology in the Busoga kingdom was structured around the actual source, which Speke did not see when he was there, and the successive waterfalls Bujagali and Itanda, respectively 8 and 30 kilometers north and downstream of the outlet of Lake Victoria.

There are innumerable spirits and divinities along the course of the Nile and its lakes in Uganda, and they are in particular living in waterfalls. Among the Busoga, the water in the falls is not holy—in fact, no water is holy—but the waterfalls are the true testament of the spirits' powers. The cascading thunders are testimonies of the powers the river spirits living there possess; the more

raw and brutal water-powers are in nature, the stronger the river-gods are believed to be.[12] At the historic source at the outlet of Lake Victoria (Fig. 3), there is a subterranean source in the middle of the river creating a counter-current seemingly rising from the Ripon and Owen Falls. According to those still believing in the traditional Busoga cosmology, this unnatural or supernatural phenomenon was a testimony to the force of the river spirit Kiyira. The most powerful spirit was living in the next waterfalls, the Budhagaali spirit in the Bujagali Falls. The force and sound of the Bujagali Falls give testimony to the powers of the Budhagaali spirit and it is truly a river spirit. Still, it moves freely around on land and wherever it wants; after all, gods are gods, spirits are spirits, and humans are humans; but unlike transcendental gods like God or Allah



*Fig. 4. Itanda waterfalls. Image courtesy of Terje Oestigaard.*



who "live everywhere," the Budhagaali spirit has its "home" in water. And although he too is "almighty" in his local context, this is not because the water is holy as such, but because he is a powerful spirit. The forces of the waterfalls prove the power of the spirits, but the spirits' powers are not dependent upon physical materialization, since spirits are spirits. In the next and the slightly smaller waterfall, the Itanda or Kalagala Falls, reside yet another pantheon of innumerable spirits, of which Itanda is the most powerful. The mighty rain and thunder-god Mesoké also lives here (Fig. 4).

Based on the natural forces as they are manifested in the powerful waters, the hierarchy of the water and river gods is: Budhaagali, Kiyria, and Itanda. In some mythologies, Budhagaali is seen as the father of the two others, who are like brothers. These spirits or gods have chosen one particular earthly representative or medium each—a healer who is an intermediary between humans and gods. In 2017, these representatives—Jaja Bujagali, Jaja Kiyria, and

Mary Itanda—were respectively 100, 44, and 47 years old. Christianity, and in particular the new churches, oppose the traditional African religion, and these healers centered around the forces of the water have often been accused of indulging in witchcraft.

Thus, at the source of the Blue Nile, the water came originally from a spring where lavish sacrifices took place, but today it is part of the Christian cosmology where the River Gihon from heaven is believed to have its earthly outlet. The source of the White Nile and the successive waterfalls, on the other hand, although having an important role in Christianity today because of the religious history made by the early explorers and the later missionaries, has a whole cosmology structured around the forces of the water, which testify to the powers of the gods, but the water itself is not holy. This directs the attention to religion and water, why water works and in what ways, and what the differences are between religious waters that are neutral, sacred, and holy, all forms of water within the divine spheres.

## Religious Water as Function or Substance

"The great river-valleys played an essential part in the rise of civilisation: in Mesopotamia, India, China, as well as Egypt. But no other river had quite the character of the Nile with its regular summer-flow and its narrow strip of fertile land between two desert expanses. That the Nile should dominate Egyptian life and thought in many ways was natural," Linsay says. "Few aspects of Egyptian life were unrelated to the great river....In turn, efforts to understand the universe and man's place in it were linked with a continual brooding of the mysterious waters." [13] Egypt's water came from unknown sources in Africa's interior, and since the dawn of civilization it was clearly different from all other waters in the world. Seneca, for instance, wanted to separate

"the Nile from ordinary rivers [since] it is unique and exceptional." [14]

In 1790, James Bruce summed up more than five thousand years of history when he remarked:

It is not to be wondered, that, in the long course the Nile makes from its source to the sea, it should have acquired a different name in every territory, where a different language was spoken; but there is one thing remarkable, that though the name in sound and letters is really different, yet the signification is the same ... Among the Agows ... it is called Gzeir, Geefa, Seir; the first of these names signifying God; it is also called Abba, or Ab, Father ... with a fervent and

unfeigned devotion, under these, or such like appellations, they pray to the Nile, or the spirit residing in that river.[15]

Following Catholic historian Christopher Dawson, “The great civilizations of the world do not produce the great religions as a kind of cultural by-product; in a very real sense, the great religions are the foundations on which the great civilizations rest.”[16] His approach is fruitful also for other societies and not only the great civilizations, because “African thought,” cultural anthropologist Victor Turner says, “embeds itself from the outset in materiality, but demonstrates that materiality is not inert but vital.”[17] Spirituality is embedded in materiality, but also active and transcending the materiality, or in the words of religious historian Mircea Eliade: “The prototype of all water is the ‘living water’... Living water, the fountains of youth, the Water of Life...are all mythological the same formulae for the same metaphysical and religious reality: life, strength and eternity are contained in water.”[18]

Water is a medium for religious and divine interaction; some water has spiritual qualities, and yet other forms of water are a distilled substance or entity of a divinity. “All around the world people have at all times attached a wide variety of religious meanings to water and the permanent uncertainties and flux of the hydrological cycle,” Terje Tvedt says. “The paradoxical natures of water – it is a life-giver and life-taker, alluring and fearsome, creator and destroyer, terrible strong and very weak, always existing and always disappearing – means that it easily can be, and often has been, ascribed all sorts of different and conflicting symbolic meanings of fundamental importance at a number of shifting levels.”[19] Importantly, there is a fundamental ontological difference whether a river is a divinity or if a divinity transfers power to the water.[20] There is yet another category of divine agencies; the water’s visible forces like torrential waterfalls illustrate the divinities’ powers, but the water is not holy or the power is not in the water itself.

Lastly, rain comes from the divine realms, but it is neither holy nor sacred (or consecrated); but it is a gift that comes with conditions.

While there is no generally accepted definition of what religion is, the problem of trying to define religion has nevertheless played a central role in developing the sociology of religion as a discipline.[21] In 1913, Henry S. Nash struggled with defining “religion”: “To attempt in these days a definition of religion may seem like taking a wanton risk of intellectual confusion. Even a rough classification of religions is difficult. The mass of data is so vast, the varieties of religion so manifold, that no sooner has a scheme of classification been established itself than it begins to sag under the weight of material thrown upon it,” he writes.[22] One century later, defining religion was as difficult as before, and in his 2013 book, *Religion Without God*, Ronald Dworkin defines religion without god.[23] Water may dissolve some of these paradoxes such as religion with or without god, and how and why religion works.

Broadly, religion can be analyzed from approaches emphasizing function or substance. Functional or pragmatic approaches see cultural phenomena as religious when some challenges or problems have divine origins and solutions, or they may be solved by direct divine intervention in one way or another. Sociologist Émile Durkheim, for instance, belongs to this category. The functional approach focuses on what problems religion can solve and what people get out of religion. Substantive approaches, on the other hand, emphasize the divine substance in whatever form. They focus on the ontological realities, like the existence of gods, divinities, and ancestors. This approach puts emphasis on rituals and the interaction between humans and the other world. Numerous scholars belong to this category, like Augustine who said that religion means “worship of God,”[24] Edward Tylor when he defined religion as “belief in spiritual beings,” and also Otto and Eliade, among others. Although heatedly debated by scholars for more than a

century, it is possible, as Kevin Schilbrack argues, to combine these two positions, not because of convenience but because it grasps the religious dimension in a better way.[25] The use (function) and beliefs (substance) of the way water works may illustrate how functional and substantive approaches are intertwined and dependent upon each other (Fig. 5).

In order to understand the religious role of water, it is preferable to distinguish between the “holy” and “sacred” as analytical categories. From this perspective, “holiness” refers to the divinity and what is derived from the divinity, whereas “sacredness” refers to consecrated items. [26] Thus, there is a fundamental difference between “holy water” and “sacred water.” The

holy water in Ganges in India is the Mother Goddess in Hinduism; the river is the goddess and the water is divine and her body. The water used in the Protestant baptism, on the other hand, is not a divinity, but consecrated and, hence, sacred water. Both holy and consecrated waters are within the religious realm, but the qualities and divine capacities and powers differ. Moreover, even within the category of truly holy water, or water embodying divine substance or qualities, there are differences; some waters have specific functions, whereas other types are more omnipotent and work for all kinds of purposes everywhere, or so it is often believed.

Thus, with water at the center, it is possible to combine functional and substantive approaches



*Fig. 5. Who controls the life-giving rains – God, ancestors or spirits? Usagara, Tanzania. Image courtesy of Terje Oestigaard.*

to religion, not only from an academic perspective, but also from a religious one as perceived by the believers in faith and rituals. It is indisputable that gods and divinities are believed to work and interfere in this world among humans for better or worse, like blessing farmers and fields with the life-giving rains or penalizing sinful communities with devastating floods, so the functional approach is obviously correct on certain premises. However, these divine engagements are

dependent upon the substantive approach, or one in which the gods and spirits exist and can intervene in the human world. In short, a substantial approach can exist without a functional approach (gods may choose not to engage in the human world), but a functional approach cannot work unless the spirits and divinities exist (without gods, rainmaking rituals cannot affect the weather).

## Polluting Purity and Purifying Pollution

Compared to most other religious practices, the use of water in general and holy water in particular represents particular and peculiar paradoxes, since the most holy is often severely polluted (physically or spiritually) in ritual use. As a result, some of the holiest rivers worldwide are also the most polluted, like the holy Jordan River. However, despite the river being highly polluted, the Latin Patriarch Vicar General of Jordan explained in 2013: “There is a distinction between the physical state of water and the sacred realm. From a religious perspective it does not matter whether the water is dense or light, clear or cloudy, polluted or not polluted. This does not touch upon the aspect of faith. [...] Pollution is a Western concern, it is Cartesian. Descartes’s influence stopped on the northern shores of the Mediterranean.”[27] Another famous and highly polluted river is the holy Ganga—the very water body of the goddess herself.[28]

While polluting other holy substances or places, like an altar, is a sacrilege and a heinous sin, cosmologically speaking, polluting holy water *in the right way* is not, which probes to the core of the rationale and ways holy water is believed to work. Worldwide, erasing pollution and impurity—sin as a bio-moral phenomenon and substance—is *the* most general and omnipresent capacity of holy water. Religiously, holy water *transmits*

*purity* and holiness, but in practice, this involves divine processes where the water is invested with supernatural powers *transferring, transporting, and transforming impurities*. Thus, in the very process of obtaining spiritual purity, devotees dispose of their impurities in the holy water either symbolically or physically. The devotees transfer the impurity to the water and the river, which transports it away—a process similar to what mundane rivers do. But if pollution and impurities were only transported away, sin and defilement would accumulate as happens with physical defilements polluting rivers. Therefore, the holiness of water and the divine agency not only accept the transference of pollution from the devotees, but the water transforms the pollution to purity. Consequently, even the most polluted holy rivers from a profane point of view are still in the religious process of transforming impurity to purity. Following this logic, holy rivers should cleanse themselves of physical pollution. If the rivers are unable to cleanse themselves, it is a sign that they have lost part of their holiness. If a river cannot transmit purity by transferring, transporting, and transforming impurities, its water is unfit for ritual practice. The holy water does not work anymore. It may still be in the realm of divinities and religious water, but it has not the qualities and capacities of functioning as holy water.[29]

While rivers like the Ganges or Jordan are highly polluted, and devotees pollute the waters spiritually and physically by their ritual activities, the source of the Blue Nile is distinctly different, although the same principles regarding holy water work at an overall level. The purity of the waters at Gish Abay has to be protected from any defilement by all means, which was also a prohibition reported by the early travellers.[30] Not only have the devotees to be Ethiopian Orthodox Christians, but even the pilgrims approaching the source must be in a pure condition despite that the aim is to use the holy water to cleanse off sins and impurities. In practice, this means that devotees purify themselves by fasting the very morning they visit the source, basically eschewing breakfast or any food before the visit. Although the Gihon River is important for Muslims and Christians from other denominations, such as Protestants, these devotees are in general seen as too impure and forbidden to approach the source.

Polluting the holy water coming from heaven is a triple sin. First, it will pollute God's holy water or basically defile the divine substance *before* it is ritually or religiously used. Second, and as a consequence, it is offending God and therefore the Almighty will punish the sinner for doing so deliberately. In fact, to sin is to act against God and his will (and this is also a sign of free will). [31] Lastly, and perhaps most important, desecrating the source will reduce the holiness of the water for other pilgrims, ultimately jeopardizing their purity and salvation. Since the effects of drinking and using the waters may work miracles for up to 70 generations, and severely sick patients attacked and demolished by the Devil use the water in exorcisms, the purity and holiness of the divine waters is not something to be taken lightly.

The beliefs and practices at the source exemplify several structural premises of the ways holy water is believed to work in religion on a general and cross-cultural level. The water from Paradise certainly *transmits purity* and holiness by

*transferring, transporting, and transforming impurities*, including chasing away Satan and his demons as well as working miracles for generations, erasing all kinds of different sins. This is truly holy water and perhaps it is difficult to get holier water in Christianity, perhaps with the exception of the waters at Lourdes in France. It is easy to understand why it has been of utmost importance to protect this holy water from impurities inflicted by, so to speak, contaminated faith; not that the water itself could not purify itself or that God could not penalize the perpetrator, but it *is* the source. Gish Abay is the closest one may get to heaven and it is an open connection flowing directly from paradise, and subsequently polluting the source will affect everyone downstream. If God is believed to demand protection of this one-way gate from heaven, so be it.

The extreme holiness and closeness to Paradise—and by definition everything in Heaven has to be holy and eternal—illustrate another aspect that limits the use of holy water and the role and importance this water may have in the overall cosmology in a religion like Christianity. The creation water or baptism is of course important in Christianity,[32] but holiness implies restriction and inclusiveness by exclusions. If there is one thing that characterizes life on earth and among people, following religious logic, it is that it is sinful and anything but holy.

In short, holy water is like a pilgrimage sanctuary in an otherwise polluted and sinful world. Herein are also the strength and limitations of holy water in ritual practice. It is extremely efficient and practical since it can be carried away in bottles and used elsewhere, but since it is holy it cannot be omnipresent everywhere at all times; a holy world would be a kind of divine existence. This is also in line with Weber, who said the natural world of religion is *differentiated*, [33] or in the words of Hocart: “Ritual would be utterly pointless if everything were charged with power. It is based on the belief that some things have power and others have not.”[34] The latter statement

is valid for world and indigenous religions alike, and it directs the attention to the even greater encompassing and total role of water in tradition and cosmos when it is not holy. Since a holy totality on earth is not possible and holy water cannot be everywhere in this world, another alternative

is that no water is holy although the water is still within the divine realms or has religious origins. Although sounding like a paradox at the outset, holiness restricts and limits the use and omnipresence of water compared to uses and beliefs of non-holy water in water cosmologies.

## Sources of Powers from Waterfalls and Rains from the Sky

From a human perspective here and now, an eternal life or existence is not possible because we will die. Hence, following Hocart, immortality is rather “freedom from premature death and the diseases that cause it and the renewal of this vigorous life hereafter.”[35] Hence, it is no wonder that the healers along the Nile from the source of the White Nile are also traditional doctors employing water and medicines, given that rituals and medicines traditionally work in very much the same ways. “Ritual has appeared throughout as a method of achieving life. Ritual has at the bottom the same end as medicine, but medicine has a more specialized purpose,” Hocart says. “Ritual promotes life by promoting everything on which life depends: crops, cattle, children – and also what these depend on: rain and sunshine. Medicine confines itself to what directly affects the body and concentrates on curing illness.”[36] Water, on the other hand, is more total and encompassing than anything else, and it represents and gives life to everyone. Those controlling these forces, or those who are the intermediaries between humans and gods, are hence extremely powerful.

A fundamental part of African traditional religions and their cosmologies is power; neither good nor bad, but both. “Power is both spiritual and material and often explicitly so. Spiritual power is believed to lead to material power – political influence and wealth....Overall, spirit power

is assumed to permeate the material world, which makes this world both something to be wary of and something that can be used in interaction with the spirits.”[37] The source of the White Nile and the Bujagali and Itanda Waterfalls are such places where the spiritual powers are strongest, and like going to a pilgrimage site such as Gish Abay where the power is available in the form of holy water, the powerful healers are believed to enable even mightier and more powerful outcomes than the effects of the Gish water from heaven. Of course this depends on whom one asks.

Thus, from one perspective it is possible to argue that one may better grasp the significance and importance of water in society and religion by emphasizing cosmologies where water is not perceived as holy if the most powerful spirits and deities are associated with or reside in different forms and types of water. As Hocart pointed out with regard to stones a long time ago, it is “the spirit in, not of a stone.”[38] It is similar with regard to the water spirits in Bujagali Falls or Itanda Falls; they live in the water, but they are not spirits or gods of water (like Ganga in Hinduism), and the water itself is not a spirit or holy. The different and varying water-worlds matter, precisely because they are the ultimate source for all life and well-being. Hence, what matters most for believers is within the realm of god or the ancestors as perceived by the devotees.

Humans, and in particular farmers, are to a large extent at the mercy of benevolent or malevolent divinities. Gods or ancestors, and in any given combination, are believed to procure the annual rains or life-giving floods, or to withhold the precious water for life as penalty for individual and communal sins.

Jaja Bujagali is perceived to be an “archbishop” in the traditional Busoga religion, and there is literally nothing in between heaven and earth he cannot request of Budhagaali spirit, with some few exceptions. It is Mary Itanda living in the next waterfalls who may incarnate the rain-god Mesoké, who also resides in these waterfalls. Although Budhagaali is the strongest and more supreme than all the other gods, including

Itanda, a fundamental aspect of the water-world such as rain is the domain of another divinity and its healer as an intermediary medium. In March 2017, when a drought was announced and dried up the land with projected harvest failure and human suffering, a goat was sacrificed to the rain-god (Fig. 6). I participated in the ritual and sacrifice aiming to provide and procure the life-giving rains at the right time and in the right amount. When I was back in October conducting other fieldwork, I visited Mary Itanda, again curious to know if the rainy season had been good. She could tell that god had been very pleased with the sacrifice; Mesoké had given the good rains and society avoided a major disaster.

*See the video [Sacrifice to the Nile River](#).*



*Fig. 6. Blood sacrifice to the rain-god Mesoké in the Itanda Falls. Photo: Terje Oestigaard.*

The importance of rain cannot be emphasized enough. “When the weather is everything – when it determines, in ways nothing else can, what will grow and how much, whether and how long time people will do migrant labour, whether it will be a feast or famine year, whether some will live or die – it is unwise not to take such things very seriously,” Todd Sanders said with regard to a case-study in Tanzania. “That the rain begins promptly and falls regularly each season – indeed, that it arrives and falls at all – is, quite literally, a matter of life or death. Without rain nothing grows. And

without growth, people and animals will wither and die.”[39]

Although commonly described as rainmaking, no human or rainmaker can make rain; the rains belong to the gods in their divine spheres. The gods can withhold the life-giving rains as penalty for sinful behaviour or bless people and land with the good rains at the right time. But people can ask their medium to request the rain-god to give the precious life-giving rains.

## A Rainmaking Ideology

From a functional approach to religion, one may thus identify at least two structuring parameters for the development and resilience of a rainmaking ideology. First, there has to be a variability in precipitation, and cross culturally it seems that the greater the variability the more likely it is that a rainmaking cosmology may evolve; this relates to the second aspect, namely dependency on the rain. For many urban dwellers in modern cities, rain is primarily a reason for putting on rubber shoes and using an umbrella, and life continues more or less the same whether it rains in February or July. For subsistence farmers living in dry areas, the annual rains in the right amount at the right time are a matter of life and death. Together, great variability of the life-giving waters and the total dependencies of these unpredictable rains, or the agro-water variabilities,[40] have historically favored religious beliefs and rituals where humans engage with divinities in various ways to ensure the arrival of the precious waters, or in more general terms, wealth and health for all.

Still, a functional approach to religion and the development of rainmaking ideologies comes short without including the substance of religion – ancestors, spirits or gods – or the divine spheres in one way or another. Moreover, although the

life-giving rains are in god’s hands and are truly a divine gift, the water itself securing and enabling life is not holy. Even in Christianity, there are also waters controlled by God that he can use benevolently or malevolently, but strictly speaking, not holy as such. In the Bible, God’s powers and uses of water are made explicit. The Lament over the River Nile is described in Isaiah:

The waters will fail from the sea, And the river will be wasted and dried up. The rivers will turn foul; The brooks of defense will be emptied and dried up; The reeds and rushes will wither. The papyrus reeds by the River, by the mouth of the River, And everything sown by the River, Will wither, be driven away, and be no more. The fishermen also will mourn; All those will lament who cast hooks into the River, And they will languish who spread nets on the waters. Moreover those who work in fine flax And those who weave fine fabric will be ashamed; And its foundations will be broken. All who make wages will be troubled of soul. (Isaiah 19:5–10)

The Lament of the River Nile is part of a longer oracle against Egypt. It describes a drought causing the Nile to dry up with subsequent social



and political unrest, and all is seen as a consequence of a judgment of YHWH.[41] Moreover, in the book of Deuteronomy the lands of Egypt are described as “a God-forsaken country” because of the particular ways it is watered while, in contrast, the Promised Land is hailed as a land of hills and valleys, “which drinketh water of the rain of heaven.” Israel was a country of benevolent waters. In Deuteronomy (11:10–13), it says: “The land you are about to cross into and possess, a land of hills and valleys, soaks up its water from the rains of heaven. It is a land which the Lord your God looks after, on which the Lord your God always keeps his eye, from year’s beginning to year’s end.”[42] In fact, rain is seen as more precious than the Torah and the creation itself, following other Hebrew scriptures: “The sending of rain is an event greater than the giving of the Torah. The Torah was a joy for Israel only, but the rain gives joy to the whole world....The day of rainfall is greater than resurrection; [...] than when the heaven and the earth were made.”[43] When God intervened in the hydrological cycle as a “rain-god,” the importance and consequences were absolute encompassing everyone and everything. Or, in other words, the Almighty’s omnipotent powers impacting everyone are clearly visible for believers when the life-giving waters turn into death and decay.

Religiously, as Weber points out, “rain was one of the awards promised by Yahweh to his devotees, who were at that time agriculturalists... God promised neither too scanty rain nor yet excessive precipitation or deluge.”[44] In other words, God controls all aspects of life through water, and although this water was not holy, it was within and from the divine sphere. From this perspective, when God worked as a traditional

water divinity, the true power and omnipotence were revealed when the water was not holy, but everywhere in the presence or absence of rains. Moreover, if the life-giving rains were holy water, all people and land would have been consecrated, and as a paradox, if this was the case and holy water was so available for everyone everywhere, it would have reduced the importance of water in other rituals.

While the latter observation is rather theoretical, abstract or theological, the more fundamental aspects of water and religion are the always localized and specific adaptations and notions of various forms of life-giving waters, even in a world religion like Judaism or Christianity. If God penalized the Egyptians with a devastating flood, the rains had, hydrologically speaking, their origin in the “water-tower” of Africa or the Abyssinian highlands, where also Gish Abay is located—the very River Gihon flowing from Paradise. Thus, even within a river basin, along the same river and based on the same scriptures in the same religion, God may apparently withhold the rains in Ethiopia causing drought in Egypt, while at the same time the source of the Nile at Gish Abay comes from heaven (and he may send the precious rains to Israel instead). These are not contradictions or paradoxes, but rather highlighting the fundamental role of water in religion: it matters right here and now for believers, and local absences or presences and specific adaptations are cosmologically conceptualized and anchored in specific environments. Thus, with water as the axis, even transcendental religions can be located and operating in ecologies dependent upon the water-worlds controlled by the very divinities, particularly if the waters are not holy.

## Conclusion

Ordinary water in culture and nature possesses qualities behaving and transcending differently

than all other elements in nature. Religious waters not only build on these inherent capacities,

but add new enigmas and transformative powers. While conceptions of holy water in the Ganges or the use of water in baptism have shaped many perceptions of what holy water is and how it works in religious practices, it might be fruitful to extend the frames and go beyond an emphasis on only holy water to religious waters in general. As seen, gods, even transcendental divinities like the Christian (or Jewish) God, have historically been believed to use their waters in many different ways directly impacting human lives and livelihood for better or worse. Apart from the Deluge, God has also withheld both the rains and rivers' inundations as penalties, but he also blessed the very same people with the precious and needed life-giving waters, not because water is holy, but because it gives lives to farmers and fields. On the other hand, the holy waters coming from Gish Abay are the closest devotees can come to collecting divine grace flowing directly from heaven.

Thus, even the Christian God may use his water in a number of different ways. Some of the waters may embody inherent heavenly holiness like the water at Gish; other types are neutral waters for farms and fields, or punishing waters such as withheld rains or torrential floods (and then there is water used as torments in different layers of the Catholic hell, for instance). Omnipotent and omnipresent gods may of course control the hydrological world; in fact, controlling and using the water-world is one of the most efficient

ways of manifesting power and affecting all people. Still, the gods in world religions are not rain or river-gods, and although the scriptures document interventions in the actual water world of life-giving rains and inundations, traditional indigenous religions are often better adapted to specific ecologies with all their spirits and rain-making practices. In water-worlds where water is not holy, the omnipresence of the cosmology may thus be even greater than in religions with holy water, since holiness implies restrictions and inclusiveness. If divinities control all water everywhere, this creates a total and encompassing worldview adapted to specific ecologies.

Water in general, and religious water in particular, will continue to fascinate and intrigue people. Although some of the paradoxes are possible to explain or partly analyze, it is nevertheless all the beliefs about the religious and mysterious qualities and divine powers that have made the River Nile the most legendary of all rivers in the world. Herein is also one of the fundamental characteristics and particularities of religious water; while most religious practices involve awe and different degrees of mysticism, the very water itself is very concrete, practical, and here and now. The religious waters look no different than ordinary water and hence the paradoxes of the ultimate source of life continue, because religious waters nevertheless have distinctly different origins, qualities, and powers.

## Acknowledgements

I would like to thank Prof. Terje Tvedt and the Satterthwaite Colloquium for fruitful discussions.

## Bibliography

[1] Hurst, E. & Phillips, P. 1931. The Nile Basin, volume 1; general description of the basin, meteorology, topography of the White Nile Basin. Government Press, Cairo, p. 1.

[2] <https://en.oxforddictionaries.com/definition/paradox> (accessed 15 February 2018).

- [3] Tvedt, T. & Oestigaard, T. 2010. A History of the Ideas of Water: Deconstructing Nature and Constructing Society. In Tvedt, T. & Oestigaard, T. (eds.). *A History of Water. Series 2, Vol. 1. The Ideas of Water from Antiquity to Modern Times*: 1-36. I.B. Tauris, London, p.16.
- [4] Oestigaard, T. & Gedef, A. F. 2013. *The Source of the Blue Nile – Water Rituals and Traditions in the Lake Tana Region*. Cambridge Scholars Press. Newcastle; Oestigaard, T. 2018. *The Religious Nile. Water, Ritual & Society since Ancient Egypt*. I.B. Tauris, London.
- [5] Lobo, J. 1789. *A voyage to Abyssinia, by Father Jerome Lobo, a Portuguese Missionary. Containing the history, natural, civil, and ecclesiastical, of that remote and unfrequented country, continued down to the beginning of the eighteenth century: With fifteen dissertations ... relating to the antiquities, government, religion, manners, and natural history, of Abyssina*. By M. Le Grand, translated from the French by Samuel Johnson, LL.D. To which are added, various other tracts by the same author, not published by Sir John Hawkins or Mr. Stockdale. Elliot and Kay, London and C. Elliot, Edinburgh, p. 110.
- [6] Johnston, H. 1903. *The Nile Quest*. Lawrence and Bullen, London, p. 51.
- [7] Bruce, J. 1790. *Travels to Discover the Source of the Nile, in the Years 1768, 1769, 1770, 1771, 1772, and 1773 in Five Volumes*. J. Ruthven, London, Vol. 3: 633.
- [8] Speke, J. H. 1863. *Journal of the Discovery of the Source of the White Nile*. Blackwood and Sons, Edinburgh and London, p. 467.
- [9] Speke, J. H. 1864. *What Led to the Discovery of the Source of the Nile*. Blackwood and Sons, Edinburgh and London, p. 469, 259.
- [10] Nwauwa, A. O. 2000. The Europeans in Africa: Prelude to Colonialism. In Falola, T. (ed.). *Africa. Volume 2. African Cultures and Societies before 1888: 303-318*. Carolina Academic Press, Durham, p. 304.
- [11] Mockler-Ferryman, A. F. 1903. Christianity in Uganda. *Journal of the Royal African Society*, Vol. 2, No. 7: 276-291.
- [12] Oestigaard, T. 2018. Waterfalls and moving waters: the unnatural natural and flows of cosmic forces. In Day, J. & Skeates, R. (eds.). *Routledge Handbook of Sensory Archaeology*. Routledge, London.
- [13] Lindsay, J. 1968. *Men and Gods on the Roman Nile*. Frederick Muller Ltd., London, p. 1.
- [14] Seneca, n.d. *Seneca in ten volumes. VII. Naturales quaestiones. I*. with an English translation by T. H. Corcoran. William Heinemann Ltd. London, MCMLXXI, 3.1.2, p. 213.
- [15] Bruce, J. 1790. *Travels to Discover the Source of the Nile*, Vol. 3: 654-5.
- [16] Dawson, C. 1957. *The Dynamics of World History*. Sheed and Ward, London, p. 128.
- [17] Turner, V. 1975. *Revelation and divination in Ndembu ritual*. Cornell University Press, Cornell, p. 21.

- [18] Eliade, M. 1993. *Patterns in Comparative Religion*. Sheed and Ward Ltd., London, p. 193.
- [19] Tvedt, T. 2016. *Water and Society – Changing Perceptions of Societal and Historical Development*. I.B. Tauris, London, p. 65.
- [20] Tvedt, T. 2016. *Water and Society*, p. 72.
- [21] Parsons, T. 1944. The theoretical development of the sociology of religion: a chapter in the history of modern social science. *Journal of the History of Ideas*, Vol. 5, No. 2: 176–90.
- [22] Nash, H. S. 1913. The Nature and Definition of Religion. *The Harvard Theological Review*, Vol. 6, No. 1: 1-30, p. 1.
- [23] Dworkin, R. 2013. *Religion Without God*. Harvard University Press, Cambridge, p. 1.
- [24] Augustine. n.d. Saint Augustine. *The City of God Against the Pagans*, with an English translation by G. E. McCracken, in seven volumes. William Heinemann Ltd, London. MCMLVII.
- [25] Schilbrack, K. 2013a. After We Deconstruct ‘Religion,’ Then What? A Case for Critical Realism. *Method and Theory in the Study of Religion* 25(2013): 107-112; Schilbrack, K. 2013b. What Isn’t Religion. *The Journal of Religion*, Vol. 93, No. 3: 291-318;
- Schilbrack, K. 2014. *Philosophy and the Study of Religions. A Manifesto*. Wiley-Blackwell, Oxford.
- [26] Oxtoby, W. G. 1987. Holy, Idea of the. In M. Eliade (ed.). *The Encyclopaedia of Religion*. Vol. 6: 431-8. MacMillan, New York, p. 434.
- [27] Châtel, F. 2014. Baptism in the Jordan River: Immersing in a Contested Transboundary Water-course. *WIRES Water*, 1: 219-227. DOI: 10.1002/wat2.1013, p. 225.
- [28] Parry, J. 1994. *Death in Banares*. Cambridge University Press, Cambridge.
- [29] Oestigaard, T. 2017. Holy water: the works of water in defining and understanding holiness. *WIRES Water* 2017. doi: 10.1002/wat2.1205.
- [30] Bruce fn. 7; Beke, C. T. 1844. Abyssinia: Being a Continuation of Routes in That Country. *Journal of the Royal Geographical Society of London*, Vol. 14: 1-76; Cheesman, R. E. 1935. Lake Tana and Its Island. *Geographical Journal*, Vol. 71, No. 4: 489-502; Cheesman, R. E. 1968 [1936]. *Lake Tana and the Blue Nile. An Abyssinian Quest*. Frank Cass, London.
- [31] Hertz, R. 1996. *Sin and expiation in primitive societies*. Occasional papers No. 2. British Centre for Durkheimian Studies, Oxford.
- [32] Oestigaard, T. 2013. *Water, Christianity and the Rise of Capitalism*. I.B. Tauris, London.
- [33] Weber, M. 1964. *The Sociology of Religion*. Beacon Press, Boston.
- [34] Hocart, A. M. 1954. *Social Origins*. Watts & Co., London, p. 31.

- [35] Hocart, A. M. 1968. *Caste. A Comparative Study*. Russel & Russel, New York, p. 18.
- [36] Hocart 1954. *Social Origins*, p. 123.
- [37] Wlodarczyk, N. 2013. African Traditional Religion and Violence. In Juergensmeyer, M. Kitt, M. & Jerryson, M. (eds.). *The Oxford Handbook of Religion and Violence*: 153-166, p. 157.
- [38] Hocart 1954. *Social Origins*, p. 30.
- [39] Sanders, T. 2008. *Beyond Bodies. Rainmaking and Sense Making in Tanzania*. Toronto University Press, Toronto, p. xiii, 3.
- [40] Tvedt, T. & Oestigaard, T. (eds.). 2016. *A History of Water, Series 3, Vol. 3. Water and Food: From hunter-gatherers to global production in Africa*. I.B. Tauris, London.
- [41] Marlow, H. 2007. The Lament over the River Nile: Isaiah XIX 5-10 in its Wider Context. *Vetus Testamentum*, Vol. 57, Fasc. 2: 229-242.
- [42] Châtel, F. 2010. Bathing in Divine Waters: Water and Purity in Judaism and Islam. In Tvedt, T. & Oestigaard, T. (eds.). *A History of Water. Series 2, Vol. 1. Ideas of Water from Antiquity to Modern Times*: 273-297 I.B. Tauris, London, p. 274.
- [43] Isaacs, R. H. 1998. *The Jewish Sourcebook on the Environment and Ecology*. Jason Aronson Inc., Northvale, NJ, p. 159.
- [44] Weber, M. 1964. *The Sociology of Religion*. Beacon Press, Boston, p. 57.

## Recommended Citation

Oestigaard, Terje. 2018. "The Sources of the Nile and Paradoxes of Religious Waters." *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/the-sources-of-the-nile-and-paradoxes-of-religious-waters/>.

## About the Author

Terje Oestigaard is a Senior Researcher in the Nordic Africa Institute, Uppsala, Sweden, and a Docent in the Department of Archaeology and Ancient History, Uppsala University. His recent book is *The Religious Nile. Water, Ritual and Society since Ancient Egypt* (I.B.Tauris, 2018).

FEATURE

# WRITING THE RIVER

By Leslie Thomas

**W**hat does the river say to you? This is the core question posed by Write to the River (WTTR), a creative writing project that I launched in partnership with the Twin Cities nonprofit Friends of the Mississippi River (FMR) and photographer Tom Reiter, in spring 2017.

Writing is not just for the Robert Frosts of the world or for professional writers who see themselves as artists. We all can be writers capturing the truth of our own lives, with their pain, joys, grittiness and heroism, if we

give ourselves a chance to trust our voice. Expressive writing can serve a wide variety of life-enhancing purposes. Fundamentally, when we put pen to paper, we have the opportunity to celebrate who we are and create a tangible product that surprises us with welcome new meanings and links. (Chavis 2011, 160)

WTTR is an open invitation, a call for all to engage with our river environment through story or poetic verse. No professional or river-related



*WTTR welcomes new river related meanings and links through creative writing.*

## ISSUE ELEVEN : SUMMER 2018

experience is necessary. All ages and writing styles are welcome, including short prose, formal verse or one's own verse. It offers an opportunity to create, and a platform to share a river connection.

It is also substantially different from the rest of FMR's work. Over its 25 years, FMR has grown to be recognized as a hardworking and strong force

for good for the metro Mississippi. Annually, it attracts thousands of people (myself included) to speak up at the capitol in St. Paul, and get our hands dirty (literally) at events where we dig, pull, and plant for the river. So how does a creative project like this fit into such a robust action- and results-oriented organization? Better than we ever thought it would.



*WTTR welcomes new river related meanings and links through creative writing.*

# A Great River Story: Friends of the Mississippi River

In 1992, a roomful of people gathered to lay out the future of a new national park flowing through the heart of the metro Twin Cities, the Mississippi National River and Recreation Area. (MNRRA).

At one of the first public meetings to create a management plan for the park, a few “river rats” looked around and felt a bit out of place. While people representing business and government interests were in attendance, there weren’t many like them: people who loved the river and were willing to speak on its behalf. That’s when Friends of the Mississippi River was born.

Officially incorporated in 1993, FMR has grown from a handful of founders to engage over 5,000 people annually as river advocates and volunteers—at community meetings, at the capitol, and in hands-on river protection and restoration projects. FMR headquarters has grown from a walk-in closet to a half-floor of a downtown St. Paul building with 19 staff in four departments: water quality, river corridor and land-use, land protection, and stewardship and public engagement.



*Out for a swim: trees along the river improve water quality and wildlife habitat.*



## ISSUE ELEVEN : SUMMER 2018

Over the years the organization has protected and restored thousands of acres of forest and prairie habitat, reduced harmful pollutants, and protected our sense of identity as a river city by preserving beloved views, parks, and natural areas that connect our metro communities to the river. All the while, it continues to cultivate tomorrow's river stewards, engaging over a thousand youth in river protection and education activities annually.

“But none of this work would be possible,” says Whitney Clark, now in his 21st year as executive director of FMR, “if it weren't for our collective affinity for the river.”

That affinity is fostered by personal and cultural connections. For Clark, it was fishing with his grandfather that strengthened his connection to nature. “During our shore lunches we listened to the waves lapping against the boat, observed the sunlight reflecting on the trees along the rocky shores. Being there with him, it was easy for me to love the natural world.” Today, Clark is proud to pass this value to the next generation, both via FMR and in his own family.

One of the biggest overarching accomplishments, Clark notes, is of a different nature. “It is the large movement we created, elevating the profile



*Padding tranquil water: one of the many ways to connect with the Mississippi River.*

## ISSUE ELEVEN : SUMMER 2018

and status of the Mississippi River in our area. Now, community members ask the question ‘Will it hurt the river?’ before proceeding.” This is a significant change in the metro-wide conversation, a paradigm shift. And even though it isn’t one that we can put numbers to, that doesn’t mean it isn’t important. In fact, it may be FMR’s most important accomplishment in its 25 years.

“FMR is about protecting the health and integrity of the Mississippi River system that we are each connected to in one way or another,” adds Clark. “Our collective affinity for the river serves as the scaffolding for all of FMR’s work; so providing a forum for people to celebrate the river and connect to one another is our core mission.”



*Seed collecting with FMR at Sand Coulee SNA in Hastings, MN. Image courtesy of FMR Staff Photographer.*

# Start by Planting Seeds

When I moved closer to the Mississippi River in 2013, I wanted to learn how I could help protect and connect to my new landscape. I found FMR online and signed up to receive their biweekly “Mississippi Messages.” Then I responded to a volunteer call for a native prairie seed-collecting event at Sand Coulee Scientific and Natural Area (SNA). “Previous seed collection is not required—all abilities and groups are welcome,” resonated with me.

I learned to identify several native plants and how to sustainably extract seeds for later planting. Renowned for its rare plant and animal species, Sand Coulee SNA offers a glimpse of what Minnesota looked like before 1850. Being there rekindled the memory of a poignant, historic diary entry I’d once read by a farmer in Lakeland, Minnesota.

June 24, 1854: The prairie is now a beautiful green interspersed with beautiful flowers in great abundance and variety. Some of these flowers must be preserved—not that they can ever be made any more beautiful or arranged with any better taste than now. But this great prairie flower garden as arranged by the hand

of the Creator is now exposed to the plow and the lowing herds are already making their paths and selecting their shades and watering places and it is plain that the native beauty must give way to the artificial.

— from the diary of Mitchell Jackson. (Blegen 1939)

After that, I signed up to become a River Guardian with FMR and receive action alerts for the river. What began as an online search for connection led to me becoming part of a large volunteer community doing meaningful environmental work. It may sound hokey to some, but there was and is a certain magic in that transformation, one that continues to inspire me. I began to write about the river in my creative work, which includes poetry, and wished for a sense of community around the more creative and personal aspects of river engagement as well. Surely there were others who felt the same?

FMR was a natural place for me to inquire about partnering on a creative writing project devoted to the river, and I’m certain a seed was planted inside me that day at Sand Coulee SNA.

## A Leap of Faith

At our first meeting, FMR Communication Manager Sue Rich acknowledged that it was my “pleasant persistence” that got the idea through the door. We laughed as we considered that this is how many projects likely begin, with a nudging person peddling their project, insistent on its potential merit. As we talked, my initial offering—a metro-wide poetry contest and anthology—evolved into something ongoing and beneficial to FMR’s mission. Writing judges were

nixed in favor of approachability and inclusion; it would be online and we’d make it as open as we could with the resources at hand.

But would anyone submit creative writing without a prize or the prestige of rising above the competition? Both storylines—the importance of persistence and faith—were familiar and fundamental to FMR. And with that, we knew we had to move forward.



*Hidden Falls showcases the varied river landscape.*

# WTTR: How it Works

The Mississippi River as it flows through the Twin Cities is not one but three rivers. It enters the metro as a prairie river with banks instead of bluffs. Then, as it roars over St. Anthony Falls in downtown Minneapolis, it becomes a gorge river wending its way through the steep-sided bluffs in south Minneapolis and western St. Paul. Finally, as it joins the Minnesota River near Fort Snelling, it relaxes and widens to become a floodplain river.

Which river would people focus on for Write to the River? Its changing nature as well as the number of visiting spots could make it a challenge

to face the dreaded blank page. We needed to give people a common starting point.

You could call it a form of Ekphrastic creative writing, a fancy word for writing inspired by other works of art, including paintings, photographs, or statues. Writers “interpret, inhabit, confront, and speak to their subjects.” No two perceptions will be the same; every writer will see something unique from their own experiences.

WTTR contributors are not limited to writing to the image provided; it is offered as a starting point to inspire writing and showcase scenes along the river.



*WTTR summer 2017 submission “Lonesome whistle” over the Mississippi River at Hastings, MN, near several FMR habitat restoration and Vermillion Stewards volunteer sites.*

## ISSUE ELEVEN : SUMMER 2018

For each season, one image is chosen by a volunteer team of writers and river enthusiasts. The image is selected from 10 photos provided by FMR volunteer photographer Tom Reiter, based on its broad inspirational and emotive qualities to serve as a writing prompt. Reiter's stunning photographs capture different scenes, elements, and activities along the Upper Mississippi River basin throughout the year.

It is often the feeling of being in a place that prompts a photographer to capture an image. Reiter explains, "When I click the camera's shutter, it's often because something I'm seeing invokes certain feelings within me. If a picture could have that effect on me, I wondered if it would produce a similar reaction in others?"

A brief caption is provided with each image, along with the location for anyone who would like to visit—we aim for just enough information to prompt participation, without overly influencing the writing direction. To get creative juices flowing, we ask readers and potential contributors a few leading questions: What feelings does the photo evoke? Does it remind you of a past experience? Can you imagine walking here? What sounds, smells and tastes might you experience?

In addition to appearing in each "Mississippi Messages," the image and invitation to submit a writing piece are shared on FMR's web and social media sites and with local libraries, bookstores,

and with colleagues, friends, and family. Participants are given approximately 6 weeks to reflect on the image, write their piece and send it to the project email. After the submission period closes, writing pieces are in turn featured on the FMR website, and the link to the online issue is distributed through the same channels for their readership to enjoy.

Tom, Whitney, Sue, and I have all been pleasantly surprised by the number of people who responded, sharing their personal river stories. And in keeping with the spirit of Ekphrastic writing, everyone has seen something different in the featured photo.

The writing reflects diversity of voice and ways the river is appreciated—as a meaningful constant, an important connection to the past and natural world, and source of healing, inspiration, and work. It includes the gripping tales of a retired towboat captain's experiences on the Lois E, a heartfelt story of a busy Minneapolis nurse who finds reprieve living on a houseboat, poignant poems of Native American ancestral river links, and inspiring memoir.

Below are the photographic image and caption prompts offered during WTTR's first year, some of the writing we received in response, and thoughts from the writers on their involvement with the project. To see all of the writing, please [visit the site](#).

# Year One: WTTR Creative Writing Sampler

## Winter 2017-18 Submission Prompt



*The sun sets upon St. Paul, MN from the beloved Indian Mounds Park bluff top view.*

## TAKING TIME

*By Jim Larson*

The sun has done its best all day  
to turn the ice back to water  
but the River won't have it.

The River knows to rest this time of year;  
no tugs, no barges, no kayaks.  
The empty trees all have the same idea.

Even the buildings  
have their eyes closed.  
Time to put this day back with all the others.

Time to gather up a few friends  
at a quiet table. Get some talk flowing about  
what keeps you warm below the surface.

## Interview with Jim Larson

**LT:** I learned you write poetry often. Is there something about WTTR that inspired you in a different way?

**Jim:** The thing that caught my fancy was the title of the whole project, "Write to the River." It did not say, "Write about the River." So it seemed appropriate to write about a photo, but to write to the river.

**LT:** Your poem gives meaningful voice to different elements within the photo. Can you share more about that?

**Jim:** This was an invitation to invest the river with a certain agency, maybe even a sense of character. And while we're at it, why not do the

same with the other elements in the photo—the sun, the trees, the buildings? The hope was to animate each thing and set them into some sort of relationship without getting all Walt Disney about it.

**LT:** How can creative writing expand awareness and appreciation of the river?

**Jim:** Any audience enjoys hearing stories about characters and their relationships. The poem, however briefly, attempts to provide that. The true completion of the piece is accomplished in the minds of the audience as they follow along and add personal associations from their own imaginations.



## Step Outside *By Christine Yaeger*

Don't lament.

The tomb of concrete spreadsheets will rake your soul,  
but the barren tracks will be uprooted into flourishing.

Step outside.

The light will cascade off of ice crystals as the flame subsides its quest,  
vanquished yet unconquered.

Listen.

Whispering grass underneath the shadowed limbs  
sunken roots, deep and abiding.

Rejoice.

The thaw will awaken the unseen miracles  
carrying messages of hope into another day.

## Interview with Christine Yaeger

**LT:** I learned you work with the Minnesota Department of Natural Resources. Can you tell me how you became involved in this field?

**Christine:** I knew I wanted to pursue a career in natural resources after taking a college course in environmental studies. I had interest in our collective dependence on natural resources, and how it brings our values into focus. Through my studies I gained a different appreciation, learning Latin names and how resources like timber are used in industry. I worked at several entities on water quality sampling, agriculture grants, and data coordination, before landing at the DNR.

**LT:** What can you tell me about your experience with WTTR?

**Christine:** I heard about WTTR through the FMR newsletter. I appreciate the important

work FMR does for water and people, and the invitation to submit a creative writing piece. I like the mission-driven nature of my work at the DNR, which involves strategic planning. WTTR offers a different opportunity, applying an artistic response to a river photograph. I was inspired by the evocative light within the image.

**LT:** Can projects like WTTR offer something meaningful for those doing environmental work?

**Christine:** WTTR is an opportunity for creative ideas to simmer and become a story or poem, and to read other river writing. Sitting alone to reflect can help to recharge from the layers and fast pace of life, as well any discouraging news, and be inspired afresh.

## Fall 2017 Submission Prompt



*A paddleboat passenger enjoying the Big River and St. Paul's iconic High Bridge.*

## Empress *by Linda Moua*

At any given moment  
I feel as though I am guest on her flowing body  
At this very moment  
She provides passage to spy on carefully hidden neighbors

At any given moment  
I could fall through her chilly surface and suffer an abrupt shock  
At this very moment  
She can only feel the towing of my paddles left to right

At any given moment  
I look up to her thicket of verdant friends to find inner peace  
At this very moment  
She has craftily coaxed me to silence as I slip into awe

At any given moment  
I see that I am only a small explorer in her noble domain  
Because at this very moment  
She has painted me a self- portrait of who she is and why she is mighty

## Interview with Linda Moua

**LT:** I learned you work with FMR. What do you do for them?

**Linda:** I work part-time as FMR's development and advocacy assistant, working in our database, doing administrative work, and occasionally assisting at off-site public events.

**LT:** Do you recall what inspired you to get involved in river work?

**Linda:** I've always tried to be environmentally conscious but my relationship with FMR transpired because I was attracted to the people who worked there, and the dedication they were known for having toward their mission.

**LT:** Is there one particular challenge pertaining to your work?

**Linda:** As someone whose childhood time outside meant pulling weeds and watering endless rows of seeds more so than hiking and swimming, I have learned that "spending time outdoors" means different things to different people, and that experiencing fun and engaging activities outdoors should happen early on. Growing up in a large, low-income and recently immigrated household, there wasn't a lot of environmentally related outings my family took, other than going to the farm. Eventually my neighborhood community started collaborating with outreach programs to take us kids on hiking trails, beaches, and other activities. I'm grateful for those experiences, but know it hasn't always been easy to establish or launch cross-cultural connections. That said, I'm proud of FMR's efforts to be mindful and inclusive in youth engagement programs, because I know how memories like those can shape one's outlook about experiencing nature.

**LT:** Is there anything you would like to share about writing to the river?

**Linda:** I loved that I was able to combine my appreciation for the river while exercising my poetry skills! I don't consider myself an avid partaker of water-related activities but have always enjoyed time spent leisurely walking alongside the river or learning about its different eco-systems. Also, reading the work from other contributors showed me that spending time with nature can unexpectedly inspire, humor, or heal us.

**LT:** Your poem is so poignant, expressing appreciation for the river. Are there any ways the writing of it spilled over into your work?

**Linda:** For me, writing this poem further attested to the river's beauty and resilience and

why people connect with FMR to help protect and restore it. It also strengthens my appreciation for the projects we do and the staff I get to work with.

**LT:** Are there any ways your work informs your creative writing?

**Linda:** While writing this poem I tapped into a memory of our FMR staff canoeing trip last fall. After much time spent worrying about capsizing, I finally started feeling those moments of unclouded reflection as I paddled down the river. My poem speaks to the river's daunting yet inspiring presence because that's what I felt that day. The emotions were easy to evoke but it took time to think through how I wanted to portray those feelings. Using techniques I'd learned in my writing courses, I decided to describe them via a poetic homage.

## Spring 2017 Submission Prompt



*“Morning Color” at Pine Bend Bluffs SNA in Inver Grove Heights, MN one of FMR’s most popular protection and restoration sites.*

## Untitled *by Michael Daugherty*

A place where my ancestors speak,  
but there is no one left to listen.  
Hush waters whisper to our souls  
to remind us of what we're missing.

I want to stop and breathe in deeply  
and try to smell the smoke of their fires.  
I want to hear their songs in the creaking  
branches, hoping that it will inspire  
me to remember my blood.

O whisper to me the inspiriting beauty  
of life that captivated my ancestors so  
that they prayed and gave thanks!

Oh why can't I see the smoke  
rising  
above the trees.

## Interview with Michael Daugherty

**LT:** Your moving poem speaks to ancestral ties to the river. Can you share a little about yourself?

**Michael:** I grew up in Quapaw, Oklahoma, where I graduated high school in 2004. Today I live in Neosho, Missouri, with my wife Amy and my son Eli. I am an enrolled member of the Eastern Shawnee Tribe of Oklahoma.

**LT:** Is there anything you'd like to share about your WTTR experience?

**Michael:** I like writing poetry, but don't share it too often. I'm an introvert and with no formal education in creative writing, very self-conscious when it comes to my writing. When I first saw the photo of the sunrise over the Mississippi, I was in awe of how beautiful it was. The first image that came to mind was seeing smoke rising above the trees. I wondered if Indigenous people, especially my ancestors, had ever camped or lived in that

area, or somewhere along the Mississippi River. I could see it. I wanted to smell that smoke. Unfortunately, there was no smoke and any sign of Indigenous people living there would most likely be gone. The poem came to me pretty easy, though it took me a day and a half of reading the poem over and over again before I finally submitted it. I'm glad I did. I was very excited to see it on the website. I'm very proud of it and extremely thankful for the opportunity.

**LT:** Is there a river photographic image you can suggest for our project?

**Michael:** I can't think of an image, but hope this project continues. The stories people share about those places have their own vision, knowledge, and love for the water and land that can open our eyes to a different way of how we look at the earth. I think it's good to share with each other our love for the earth. There is a deeper

understanding to be gained from each other. The poetry and prose I've read on the website are amazing and touching.

**LT:** Can you share anything that speaks to the power of story?

**Michael:** I believe storytelling is an important part of any culture. Stories can open minds, inspire, and heal. A single story can plant love inside the hearts of children for a world that can seem scary. A story can teach and inspire people

to care for the earth and for each other. Stories tell us who we are, who we were, where we come from, and where we can go. When it comes to our future, our children, nothing is more important than an inspiring story to help open their minds to alternate paths in life, rather than a single path that society demands they take. Our lands, our air, our water—they don't survive unless we can tell a child a story that teaches them the importance of those sacred elements. Stories have to live on in our children to pass on to our grandchildren. That's how we change the world.

# The River Story Map

In Spring 2017, I was profoundly moved by one Write to the River submission in particular, a letter to the river from Michael Bischoff. In it,

Michael thanks the river for the healing role it continues to play in his life with terminal brain cancer.



*Michael Bischoff reflects near the river's edge.*



## Dear Mississippi River,

You are family to me, so you probably know my story already, but I'm writing to express my love and gratitude for you and all those who have cared for you, and loved you, as I do.

I found out a year and a half ago that I have an aggressive kind of brain cancer. We tried chemo, but it didn't work. The cancer grew while I was taking the chemo. We tried a new experimental treatment, but yesterday my doctor told me that treatment was ending because it hadn't produced enough results. So, I've turned to you, dear river, as my primary healer. A year ago, I made a commitment to myself and you, that I would come slowly walk and sit by your banks every day. I committed to receiving the healing, wisdom, and grace you wanted to offer. You've been my most faithful and generous healer. I trust you, and I will be faithful to you. This week you guided the great blue herons to an island in the middle of your waters, close to my house. I sit at your edge and watch the herons flirt and fight in their nests, above your patient waters. My wingspan is the same as the herons. As they stretch their wings, I hold out my arms, gliding with them over your waters. I want to share their intimacy with you, flying so close to you, getting to know your length.

You've been so generous with me, nourishing me, washing away cancer and anxiety. If I believed medical statistics guided my body, my life would be over tomorrow. But I know that your water fills and guides my body more

than medical statistics. I know that I am a small part of your watershed, and that after my body stops breathing, I will still be a part of your wholeness.

Today, and every day, I will sit at your side, watching the ice melt into your wholeness, hearing the woodpeckers knock pieces of the trees down closer to you. As my body declines, may I also fall into your wholeness, resting in the grace you carry across this continent that we call home.

— Michael Bischoff

Not long after, Michael and I were sitting at a table discussing his idea for another new project: The River Story Map. While it can occasionally overlap with WTTR, the River Story Map aims to capture and share personal river stories tied to the specific place along the river connected to their experience.

The [River Story Map](#) launched in January 2018, featuring 25-plus stories of connection to the river in honor of FMR's silver year. These honest and personal reflections portray the river as a source of intrigue and adventure, a beloved date night venue, and even an unlikely partner in tales of loss and healing.

As the map continues to grow, we expect word about it to circulate more as well. Michael asked me to be sure to let Open Rivers readers know that we welcome everyone to add an image and story about a place along the river that is meaningful to them.

# The Power of Sharing Creative Writing

I often think of WTTR unfolding as dendritic branches from Tom Reiter's lens, to the writer's creation, to the reader's mind. Like seed collecting in a prairie, a sense of community develops around contributing to something meaningful while sharing river interpretations.

"The Mississippi River is an incredibly valuable natural asset," says photographer Reiter. "Those who take the time to explore its wonder are richly rewarded with its beauty, history and power."

It's those feelings that people enjoy sharing with others and WTTR provides the forum."

While the River Story Map has afforded greater opportunity to connect to the river locally, WTTR has found itself expanding across state and even international lines. Writer Barbara DeCoursey Roy lives in St. Louis, but assists with WTTR photo selection. She also contributed a thought-provoking submission to the winter 2017 prompt about the river's power as a connective force during divisive times:



*WTTR Spring 2018 image. Our Twin Cities river corridor is part of an internationally significant flyway that provides vital resting places and food for both resident and migrating birds.*

## Great River

*By Barbara DeCoursey Roy*

The river doesn't see color or division.  
Red or blue states merely states  
of being—sundown trending garnet,

but turning midnight blue just before dawn  
cleanses muddy water, washing away  
the sins of the fathers.

One indivisible. Holy water, the Black Robe  
rode; bloody water, Grant's ironclads trolled.  
Hosting both beaver and trapper.

Oasis for Red on their trail of tears;  
a Red Sea for Blacks hankering for  
the warmth of other suns.

Strife-roiled, yet rolling. On. Unconstrained  
by armies of the dead. Breaking boundaries  
imposed by paltry dreams, feeding underground

streams, breaching the banks of imagination.  
A mighty chorus of voices singing "Mni Wiconi."  
Water is Life. Colorless, fluid, never tame.

DeCoursey Roy shared the edition in which her poem was featured on Facebook and a dozen of her international poet friends posted congratulations or shared the link. "Great poems, like the river, serve as containers to hold the tension

of opposites. I believe in the power of writing to forge connections among diverse groups of people. I believe the love of our country's great natural resources has the same power, if we harness it," says DeCoursey Roy.

## Impact: Our Collective Affinity

So far, roughly 3,300 people have visited Write to the River online, most spend a long time on the page, with roughly two-thirds of them returning. And while we don't request demographic information, we can say there has been a diverse mix of backgrounds, including some identifying as Native American and some as Hmong. Experience levels on the river vary from people

frightened of being on the water to seasoned river pilots.

But how do you quantify the impact of a poem or a creative writing project? Numbers can be illusory or, when they are available, misleading. Webpage hits can't capture poems shared on social media or printed and hung in an office

cubicle. And while we can point to a rise in the number of WTTR readers, as well as River Guardians and members, this is little more than correlation. We know that some WTTR participants (even ones who submit works that could be considered politically charged) prefer to remain solely connected to the creative writing side of things. But we also know that many advocates and environmentalists delight in the opportunity to reconnect to the passion that underlies their work.

“WTTR is a reminder of the heart connection many of us have as river advocates, but don’t always get the chance to express while working in policy or natural resource science,” says FMR director Clark. “It’s all important; the work of volunteers, organizations, elected officials, scientists, etc., and based on a shared underlying foundation. WTTR is an opportunity to tap into that deeper foundation of place and create a confluence of ideas.”

As we see both WTTR and the River Story Map circulated among not only traditional writing circles but fellow water organizations, watershed districts, and other agencies, and as the writing continues to flow in, we are honored to provide a forum to strengthen our connection to the river, to refuel, and recharge. We also can’t help but wonder if we created a niche no one knew needed to be filled.

As part of the celebration of FMR’s 25th anniversary, a special exhibit of Write to the River took place July 3-29 at the Wabasha Brewing Company near the river in St. Paul. Visitors stopped by for a pint, a photo, and a poem or story to honor FMR’s 25 years of protecting, restoring and enhancing the river.

For questions about Write to the River project, contact Leslie Thomas at [writetotheriver@fmr.org](mailto:writetotheriver@fmr.org). To learn more about FMR, Write to the River, and the River Story Map, link to: <https://fmr.org>, <https://fmr.org/write-to-the-river>, and <https://fmr.org/river-stories-map>.

*All images courtesy of Tom Reiter, unless otherwise stated. Special thanks to FMR Communications Manager Sue Rich, who contributed to this article.*



*River ‘concrete’ poem by Christine Bronk from Fall 2017 Write to the River.*

## References

Blegen, T. C. 1939. *Minnesota Farmers Diaries*. St. Paul: The Minnesota Historical Society.

Chavis, Geri Giebel. 2011. *Poetry and Story Therapy: The Healing Power of Creative Expression*. London: Jessica Kingsley Publishers.

## Recommended Citation

Thomas, Leslie. 2018. "Writing the River." *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/writing-the-river/>.

## About the Author

Leslie Thomas is a writer, historian, aviation professional, and river guardian. She holds a master's degree in landscape, environment and history from the University of Edinburgh. She is a Minnesota certified wetland delineator in-training and member of Poets Abroad, an international poetry group. She lives along the Big River in Wisconsin, and enjoys kayaking, hiking, and gardening.

ISSUE ELEVEN : SUMMER 2018

PRIMARY SOURCES

# PARADOXES OF WATER: A READING LIST

By The Editors of *Open Rivers*



*Fishing on the Nile. Photographer Islam Hassan.*

# Equity and Access

Questions about water are often implicitly about systems of power. The benefits and impacts of how water is used, distributed, and accessed are unevenly distributed. Water thus becomes a site where the inequalities in society

are made visible and contestation arises. The readings listed here offer a sample of some of the ways water is implicated in systems of inequality and work toward social justice.

## Reading List for Equity and Access

Fleck, John. 2016. *Water is for Fighting Over and Other Myths about Water in the West*. Washington: Island Press. <https://islandpress.org/book/water-is-for-fighting-over>.

Kang, Simi. 2018. "States of Emergence/y: Coastal Restoration and the Future of Louisiana's Vietnamese/American Commercial Fisherfolk." *Open Rivers: Rethinking Water, Place & Community*, no. 10. <http://editions.lib.umn.edu/openrivers/article/states-of-emergence-y/>.

Mizelle Jr., Richard M. 2016. "Princeville and the Environmental Landscape of Race" *Open Rivers: Rethinking The Mississippi*, no. 2. <http://editions.lib.umn.edu/openrivers/article/princeville-and-the-environmental-landscape-of-race/>.

US Water Alliance. 2017. *An Equitable Water Future: A National Briefing Paper*. Washington, D.C.: US Water Alliance. [http://uswateralliance.org/sites/uswateralliance.org/files/publications/uswa\\_waterequity\\_FINAL.pdf](http://uswateralliance.org/sites/uswateralliance.org/files/publications/uswa_waterequity_FINAL.pdf).

# Knowing and Designing

Human relationships with water have moved toward control of water despite the reality that water often exceeds our human designs. Yet how might our relationships differ if we focus on

knowing waters rather than intervening on them? Here we offer readings that are provocations for reevaluating our designs on water and exploring how we might learn to know water differently.

## Reading List for Knowing and Designing

Buturian, Linda. 2018. "The River is the Classroom." *Open Rivers: Rethinking Water, Place & Community*, no. 10. <http://editions.lib.umn.edu/openrivers/article/the-river-is-the-classroom/>.

Little, Barbara J., and Katie Crawford-Lackey. 2017. "Where the Water Takes You: Unlocking Place-based Meanings through Inquiry at the Tidal Basin in Washington, D.C." *Open Rivers: Rethinking Water, Place & Community*, no. 7. <http://editions.lib.umn.edu/openrivers/article/where-the-water-takes-you/>.

McPhee, John. 1987. "Atchafalaya." *The New Yorker*, February 23, 1987. <https://www.newyorker.com/magazine/1987/02/23/atchafalaya>.

Underhill, Joseph. 2017. "What we Learned from the River." *Open Rivers: Rethinking The Mississippi*, no. 6. <http://editions.lib.umn.edu/openrivers/article/what-we-learned-from-the-river/>.

Yarina, Lizzie. 2018. "Your Sea Wall Won't Save You." *Places Journal*, March 2008. <https://places-journal.org/article/your-sea-wall-wont-save-you/>.



# Identity and Community

Our relationships to each other are shaped in part by how we engage with the natural world. We form our identities through entanglements with water, place, and other people. Water helps shape who we are just as we reciprocally have impacts on water. In this section, the readings encourage us to consider how water is implicated in the ways we form identity and community.

## Reading List for Identity and Community

Huxtable, Tyler. 2017. "Making an Icon out of the Los Angeles River." *Open Rivers: Rethinking The Mississippi*, no. 6. <http://editions.lib.umn.edu/openrivers/article/making-an-icon-out-of-the-los-angeles-river/>.

Langston, Nancy. "The Wisconsin Experiment." *Places Journal*, April 2017. <https://placesjournal.org/article/the-wisconsin-experiment/>.

Matteson, Shanai. 2018. "Water Bar: Water is All We Have." *Open Rivers: Rethinking Water, Place & Community*, no. 9. <http://editions.lib.umn.edu/openrivers/article/water-bar/>.

Ruskey, John, and Boyce Upholt. 2018. "Free-Flowing Waters: A Vision for a Lower Mississippi River Wilderness." *Open Rivers: Rethinking Water, Place & Community*, no. 9. <http://editions.lib.umn.edu/openrivers/article/free-flowing-waters-a-vision-for-a-lower-mississippi-river-wilderness/>.

Vanderbilt, Tom. "The City and the Sea." *Places Journal*, May 2013. <https://placesjournal.org/article/the-city-and-the-sea/>.

# Human and Natural

Water is both a physical material and inextricably tied to human systems. As a physical material, we analyze processes that affect the chemical composition, biological systems, and physical flows of water. As part of social systems, water is tied to human practices, livelihoods, and interventions.

How we understand water as a physical material and a cosmological presence can reconfigure how we relate to water and the world more broadly. Texts in this section challenge us to think about water through multiple lenses.

## Reading List for Human and Natural

Carlson, Andrea. 2018. "On The Uncompromising Hand: Remembering Spirit Island." *Open Rivers: Rethinking Water, Place & Community*, no. 9. <http://editions.lib.umn.edu/openrivers/article/on-the-uncompromising-hand-remembering-spirit-island/>.

Stensrud, Astrid B. 2016. "Climate Change, Water Practices and Relational Worlds in the Andes." *Ethnos*, vol. 81, no. 1: 75–98. <https://www.tandfonline.com/doi/abs/10.1080/00141844.2014.929597>.

# Particular and Universal

We interact with water at the level of experience, yet we understand water as a global material, universally necessary for life. We make claims about water at both these scales and often the differences in scale reveal conflicting ideas, needs,

problems, and potentials. These readings highlight some of the challenges of trying to engage and care for water across scales of interaction and knowing.

## Reading List for Particular and Universal

Bierbrauer, Anna. 2017. "Lost to Progress: Upper Mississippi River and Minneapolis Parks Development." *Open Rivers: Rethinking Water, Place & Community*, no. 7. <http://editions.lib.umn.edu/openrivers/article/lost-to-progress/>.

Mazack, Jane E. 2016. "The Once and Future River: A Present Snapshot." *Open Rivers: Rethinking The Mississippi*, no. 4. <http://editions.lib.umn.edu/openrivers/article/the-once-and-future-river-a-present-snapshot/>.

Norman, Emma S., Christina Cook, and Alice Cohen. 2015. *Negotiating Water Governance: Why the Politics of Scale Matter*. London and New York: Routledge. <https://www.routledge.com/Negotiating-Water-Governance-Why-the-Politics-of-Scale-Matter/Norman-Cook/p/book/9781409467908>.

Tvedt, Terje, and Eva Jakobsson. 2006. "Introduction: Water History is World History." In *History of Water*, edited by Terje Tvedt and Eva Jakobsson, ix–xxiii, Series 1, Vol. 1, *Water Control and River Biographies*, (series editor Terje Tvedt). London and New York: I.B. Tauris. <https://waterhistory.w.uib.no/series-1/volume-1/>.

Tvedt, Terje, and Terje Oestigaard. 2014. "Urban Water Systems – A Conceptual Framework." In *History of Water*, edited by Terje Tvedt and Terje Oestigaard, 1–21, Series 3, Vol. 1, *Water and Urbanization*, (series editor Terje Tvedt). London and New York: I.B. Tauris. <https://issuu.com/uibgeografi/docs/vol7>.

# Peaceful and Contested

From narratives that demonstrate human reverence for water as pristine, cleansing, and unifying to narratives of water as the site of conflict, challenge, and uncertainty, we simultaneously hold

water as both a source of struggle and a source of peace. The pieces in this section demonstrate the paradox of our affective and social relationships with water.

## Reading List for Peaceful and Contested

Cheremie, Kristi Dykema, and Michael Pasquier. 2013. "The Lost Graves of the Morganza Floodway." *Places Journal*, January 2013. <https://placesjournal.org/article/the-lost-graves-of-the-morganza-floodway/>.

Davis, Meredith. 2016. "Re-imagining the River: The Transformation of New York's Waterways in Marie Lorenz's Tide and Current Taxi." *Open Rivers: Rethinking The Mississippi*, no. 3. <http://editions.lib.umn.edu/openrivers/article/re-imagining-the-river-the-transformation-of-new-yorks-waterways-in-marie-lorenzs-tide-and-current-taxi/>.

Hagen, Roar, Graham Chapman, and Terje Tvedt. "Water, Geopolitics and Collective Power in the New World Order." In *History of Water*, edited by Terje Tvedt, Graham Chapman, and Roar Hagen, 3–27, Series 2, Vol. 3, *Water, Geopolitics, and the New World Order*, (series editor Terje Tvedt). London and New York: I.B. Tauris. <https://issuu.com/uibgeografi/docs/vol6>.

Matson, Laura. 2017. "Treaties & Territory: Resource Struggles and the Legal Foundations of the U.S./American Indian Relationship." *Open Rivers: Rethinking The Mississippi*, no. 5. <http://editions.lib.umn.edu/article/treaties-territory/>.

Westerman, Gwen, Nenetta Luarca-Shoaf, and Laura Turner Igoe. 2016. "Depicting the Power of Water in Art and Poetry." *Open Rivers: Rethinking The Mississippi*, no. 3. <http://editions.lib.umn.edu/openrivers/article/depicting-the-power-of-water-in-art-and-poetry/>.

# Local Water

The texts listed in this section focus on water in Minnesota and the myriad complexities of social and ecological systems in this place.

## Reading List for Local Water

Anfinson, John O. 2017. "What It Means to be a 'Partnership Park' – The Mississippi National River and Recreation Area." *Open Rivers: Rethinking The Mississippi*, no. 5. <http://openrivers.umn.edu/article/what-it-means-to-be-a-partnership-park-the-mississippi-national-river-and-recreation-area>.

Devitt, Stephanie. 2018. *The State of Minnesota's Water: An Evaluation of Stakeholder Perspectives on Water Priorities*. Minneapolis: McKnight Foundation. <https://www.mcknight.org/wp-content/uploads/McKnight-RiverReport.pdf>.

Smith, Mona M. 2016. "Owámniyomni, a Dakota Name for 'St. Anthony Falls.'" *Open Rivers: Rethinking The Mississippi*, no. 4. <http://editions.lib.umn.edu/openrivers/article/owamniyomni-a-dakota-name-for-st-anthony-falls/>.

University of Minnesota Water Resources Center. 2011. *Minnesota Water Sustainability Framework*. St. Paul: University of Minnesota Water Resources Center. [https://www.wrc.umn.edu/sites/wrc.umn.edu/files/mwsframeworkcompletefinal1\\_201\\_o.pdf](https://www.wrc.umn.edu/sites/wrc.umn.edu/files/mwsframeworkcompletefinal1_201_o.pdf).

Wells, John, and John Helland. 2002. *Connecting with Minnesota's Urban Rivers*. St. Paul: Minnesota Planning. <https://www.eqb.state.mn.us/connecting-minnesotas-urban-rivers-helping-cities-make-sustainable-choices-future>.

# Agriculture

At every scale—global to local, national to state—water for agriculture poses a perplexing paradox. Certainly, water is necessary to grow crops, and in many watersheds, agriculture is the largest water user. At the same time, agricultural practices often contribute substantially to water pollution, sending excess nutrients downstream

with negative consequences. In the United States, agriculture is cited as the leading cause of the “dead zone” at the mouth of Mississippi, an area where marine life can no longer survive. Selections here discuss the complex relationship between agricultural practice and water quality.

## Reading List for Agriculture

Elzufon, Betsy. 2015. *Collaborating for Healthy Watersheds: How the Municipal & Agricultural Sectors are Partnering to Improve Water Quality*. Washington, D.C.: Agee, National Association of Clean Water Agencies, and U.S. Water Alliance. [http://uswateralliance.org/sites/uswateralliance.org/files/publications/2015-01-30muni\\_ag\\_wp\\_o.pdf](http://uswateralliance.org/sites/uswateralliance.org/files/publications/2015-01-30muni_ag_wp_o.pdf).

IAASTD. *n.d.* *Agriculture at a Crossroads: Findings and Recommendations for Future Farming*. Global Agriculture: Bochum, Germany. Accessed July 20, 2018. <https://www.globalagriculture.org/>.

Lilliston, Ben, and Lachlan Athanasiou. 2018. “From the Ground Up: The State of States on Climate Adaption for Agriculture.” Executive Summary. Minneapolis: Institute for Agriculture and Trade Policy. <https://www.iatp.org/state-climate-adaptation-plans>.

U.S. Water Alliance. 2014. *Coming Together to Protect Mississippi River Watersheds: Agriculture and Water Sector Collaboration for Nutrient Progress*. Washington, D.C.: U.S. Water Alliance. <http://uswateralliance.org/sites/uswateralliance.org/files/publications/MRND-FINAL-REPORT.pdf>.

Pacific Institute. 2018. “Issues We Work On: Water, Food, and Agriculture.” Oakland, CA: Pacific Institute. <http://pacinst.org/issues/water-food-and-agriculture/>.

## Recommended Citation

Editors of Open Rivers. 2018. “Paradoxes of Water: A Reading List.” *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/paradoxes-of-water-a-reading-list/>.

PERSPECTIVES

# AN ENDANGERED RIVER: THE MISSISSIPPI RIVER GORGE

By Olivia Dorothy

Restoring One River in the Land of 10,000 Lakes



*The fall colors along the Mississippi River are framed nicely by the Ford bridge.  
This photograph was taken looking upstream of Lock and Dam 1 in Minneapolis, Minnesota.  
USACE photograph by Sam Mathiowetz.*

Almost 500 river miles below its source at Lake Itasca, the Mississippi River tumbles over its only waterfall in downtown Minneapolis. Dubbed the Falls of Saint Anthony by explorer Father Louis Hennepin, the falls were formed by glacial action more than 10,000 years ago. The magnificent waterfall was once over 200 feet high and located in downtown St. Paul. Over the years, the falls migrated upstream to their present location in downtown Minneapolis. The migrating waterfall left an eight-mile trail of broken limestone in its wake, earning its Anishinaabe (Ojibwa) name *gichi-gakaabikaa*, or “great severed rock.”

Today, the aquatic Gorge ecosystem is drowned by navigation dams. But a recent action by Congress to close the head of navigation in

Minneapolis has instigated a U.S. Army Corps of Engineers (the Corps) protocol to review and determine the fate of federal infrastructure through this stretch of the river. Through this process, there is an opportunity to evaluate ecosystem restoration and dam removal options.

Removing the dams would revive critical habitat for several state and federal endangered species, including lake sturgeon, paddlefish, and eleven species of mussels. But before a jackhammer touches the dams, a litany of questions needs to be answered.



*Lock and Dam 1 during the UWCA Partner Paddle, 2010. Image courtesy of Greg Lais.*



# The Problem: Loss of a Big River Rapid

The stretch of broken limestone below the falls is known as the Mississippi River Gorge for its narrow floodplain and steep valley, dropping over 100 feet in just eight miles. The gorge was once one of four big river rapids on the Upper Mississippi River, the others historically located in Rock Island, Illinois, Keokuk, Iowa, and St. Louis, Missouri. Of the four, only a remnant of the St. Louis “Chain of Rocks” rapids remains today. That rare piece of rapids in St. Louis is a critical spawning area for native fish and, likewise, biologists believe the Mississippi River Gorge was once a critical component of the river’s ecosystem and fishery.

Two dams are drowning the rapids today: Lock and Dam 1 and Lower St. Anthony Falls Lock and Dam. Lock and Dam 1 was originally constructed in 1917 just above the confluence of the Minnesota and Mississippi Rivers to facilitate navigation and began supplying power to the Ford Motor Company assembly plant in the 1920s. Ford closed the plant, and Brookfield Power Company has been generating electricity at the site since 2008. Lower St. Anthony Falls Lock and Dam was built just below the falls in the 1950s and 1960s by the Corps to support commercial barge traffic through the gorge and above the falls.



*Traversing the Upper St. Anthony Falls Lock in 2010, with a view of the Stone Arch Bridge. The lock is now closed to traffic. Image courtesy of Greg Lais.*

# The Opportunity: Disposition of Corps Infrastructure

Removing dams is a commonly used approach to restore a river's natural form and function. Dam removal projects can range from simple projects that remove relic mill dams on small streams to complex and active hydropower dams that are over 100 feet tall. For the past 20 years, American Rivers, a leading river conservation organization, has helped lead a national effort to bring rivers back to life through dam removal.

Because Congress closed Upper St. Anthony Falls Lock, there is a window of opportunity to remove or modify the Lower St. Anthony Falls Lock and Dam and Lock and Dam 1 and restore the historic rapids habitat. Both dams are operated and maintained by the U.S. Army Corps of Engineers. Due to budget constraints, Congress has instructed the Corps to review all their infrastructure and make recommendations on divestments.



*Rendering of what restored rapids in the river may look like, showing the river at the Franklin Avenue Bridge. Image courtesy of American Rivers.*

In response, the Corps has initiated disposition studies around the nation. A disposition study on the locks and dams of the Green and Barren Rivers in Kentucky has already led to the removal of one dam and potential removal of two more to

eliminate liabilities and restore river habitat. In Minneapolis, the Corps has initiated disposition studies on the Lower St. Anthony Falls Lock and Dam and Lock and Dam 1.

## What is a disposition study?

Disposition studies are conducted by the Corps on infrastructure that may no longer be meeting its congressionally authorized purpose. The essence of the study is binary: should the Corps continue to operate and maintain the

infrastructure? Yes or no. If the answer is “no,” the Corps will initiate additional steps to release the infrastructure, usually by selling or giving the infrastructure to another entity.



*The Mississippi River gorge. Image courtesy of Olivia Dorothy.*

# The Challenges

There are many issues that need to be examined before the dams can be removed. A feasibility study needs to be completed to investigate the engineering challenges and determine project costs. Included in the feasibility study would be site-specific reviews that are of interest to the community. Questions identified at an open house in July 2017 related to:

- Identifying other locations for competitive rowing activities;
- Replacing lost hydropower with another renewable energy source;
- Clarifying the environmental benefits of dam removal in the gorge;
- Developing plans to expand/improve recreational access;
- Exploring the needs of minority and low-income people in planning; and
- Identifying any infrastructure that might be vulnerable to changing river discharge.

Experts at local, state, and federal agencies and at American Rivers are starting to evaluate these and other critical questions to inform the community decision-making.

# How to Get Involved

If you are interested in weighing in on this critical decision about the future of the Mississippi River in the Twin Cities, here are several opportunities.

Visit the American Rivers website to send a letter to the Corps about restoring the Gorge. Talk to your elected officials about what you want for the future of the Mississippi River Gorge. Talk to local agency officials about the future of the Gorge. Minnesota Department of Natural Resources and the National Park Service will

provide expert advice on the future of the Mississippi River Gorge. Let them know what you think.

The outcome of the disposition study will be a landmark moment for the future on the Mississippi River in Minneapolis. It is critical to ensure community engagement with the agencies that manage the river, because this decision will define the Mississippi River in the Twin Cities for generations to come.

## Recommended Citation

Dorothy, Olivia. 2018. "An Endangered River: The Mississippi River Gorge." *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/the-mississippi-river-gorge/>.

## About the Author

Olivia Dorothy joined American Rivers in 2014, and works on reforming the management of the Mississippi River. She facilitates the Nicollet Island Coalition, a group of environmental, taxpayer, and conservation organizations focused on restoring a sustainable Upper Mississippi River. Prior working at American Rivers, Olivia worked on similar issues at the Izaak Walton League of America. Before entering the non-profit sector, Olivia worked in Illinois government as a rivers and water policy advisor. She has a Bachelor of Science in Natural Resources and Environmental Sciences and a Master of Art in Environmental Studies from the University of Illinois.

TEACHING AND PRACTICE

# PARADISE LOST:

# THE STRUGGLE TO PRESERVE THE PONGOLA RIVER AND ITS INHABITANTS

By Shira Lanyi

**I**n December of 2016, I went on the journey of a lifetime to kwaZulu-Natal, South Africa on a faculty-led excursion titled “Summits to Sea”

with Virginia Commonwealth University (VCU). Along with nine other students and two faculty members, we traversed across South Africa from



*Jozini Dam, South Africa, during a drought. Image courtesy of Shira Lanyi.*

## ISSUE ELEVEN : SUMMER 2018

the source of the great rivers in the Drakensburg Mountains all the way to their opening in the Indian Ocean. For three weeks, we hiked, swam, and kayaked our way through the various water systems that affect the economy, ecology, and public health in South Africa. The dramatic impact that drought has on the availability of clean, drinkable water in South Africa is staggering. The great Pongola River Dam represents one of the greatest challenges between balancing the influence of government-controlled infrastructure and the health and vitality of the river's stakeholders.

As I look out from Pongola River Camp onto the luminescent banks of the sun-kissed South African soil, the chirping of an African Jacana,

the laughter of children splashing in the shallow water, and the solemn croak of a lonely toad paint the perfect image of the beauty and biodiversity that shape this river system. Pongola River Camp, located about twenty kilometers downstream from the Jozini Dam, is a secret get-away tucked into the riparian vegetation along the river bank. This is the last stop on our week-long exploration of the Pongola River watershed as part of a VCU course exploring the intersection of freshwater resources and biodiversity along the Tugela and Pongola Rivers in kwaZulu-Natal, South Africa.

The Pongola River is one of South Africa's most biologically diverse ecosystems rich with hundreds of species of fish, birds, and animals.



*Wetland on the Pongola River. Image courtesy of Shira Lanyi.*

The region is also home to thousands of local Amathonga people who have used this water system as their primary resource for generations. However, the contemporary scene of the Pongola River is one that is defined by the troubles of rapid population growth and poverty. As we drove to the river's access point for our kayaking excursion, we passed through the dirt streets of sprawling low income housing developments near the Jozini Mall. The trash littering the shores and waters of this major flood plain are an

indication of the serious threat humans have on the future health and conservation of the river's ecosystem. During the wet season, the Pongola normally flows deep, swift, and clear. The river is now barely deep enough for our kayaks to scrape through and are choked with native and invasive aquatic plants. The rainy season typically begins in October and lasts until April; however, the excessive drought now haunts this region year-round.

## Pongolapoort Dam and Water Management

Our explorations of the Pongola watershed extended upstream and downstream of the impressive Pongolapoort Dam. This is the fifth largest dam in South Africa and blocks the narrow Pongola gorge at the town of Jozini (Van Vurren 2009; Department of Water Affairs and Forestry, South Africa 2004). Jozini overlooks the dam's vast reservoir at the base of the Lebombo Mountains. As we passed through the town, the streets were busy with the morning rush of local people setting up their carts along the road to sell brightly colored clothes, produce, meat, and stylish haircuts. The town of Jozini was originally established to house the estimated 900 black employees used during the building project of the Pongolapoort Dam in the 1960s (Colvin et al 2016). The Jozini Dam, or Pongolapoort Dam, was constructed by the South African Department of Water Affairs (DWA) to alter the natural flows of the Pongola River in order to provide adequate water for the irrigation of sugarcane fields along the adjacent flood plains. During the 1930s, the rich soil and natural resources along the Makatini Flats, the fertile region directly adjacent to the Pongola River, attracted white farmers who established large-scale commercial farms. A government irrigation scheme was enacted to assist in the growth of sugar cane, maize, and other cash crops (Van Vurren 2009; Dube et al. 2015: 269–272). The intent to provide commercial

farmers with the resources to promote economic growth within the region has subsequently been met with criticism for its effects on the natural hydrology and flow patterns of the Pongola River. As our group peered over the curved edges of the vast dam wall, the blanket of green algae in the shallow outflow pool was an indication of the trouble facing this region.

The social and economic implications of the Pongolapoort Dam and the timing of the flood-releases are a complex balancing act between the needs of the flood plain ecosystem and the needs of commercial agriculture. Driving through the plains surrounding the Pongolapoort Reservoir, we see fields of sugarcane carpeting the valley and foothills of the surrounding Lebombo Mountains. Upon completion of the dam in 1973, conservationists recognized the threat the dam had on the health and vitality of the floodplains directly downstream. Water management programs were initiated by Coca-Cola Company, South Africa under the directorship of Professor Charles Breen and Jan Heeg in the 1970s. These programs aimed to protect the “social-ecological system” by simulating the natural flooding patterns of the region (Colvin et al. 2016). The annual flooding of the Pongola River is vital for the desalination of the nutrient-dense waters and is a cue for indigenous fish species to migrate and breed



## ISSUE ELEVEN : SUMMER 2018

upstream (Dallas 1997: 85-89). Without these flood releases, the river becomes as it is today, inundated with dense aquatic plant growth blanketing the river's surface. The local Amathonga people rely on the Pongola River for their livelihood and agriculture, and as a food source for their families and cattle. To address these needs, the Cooperative Scientific Program by Breen and Heeg proposed a flow regime to simulate the endemic Pongola River flows at 2 cubic meters per second in the winter and between 600 and 800 cubic meters per second during the summer (Colvin et al. 2016; Dallas 1997: 87).

More recently in post-apartheid South Africa, the new government enacted a series of progressive

laws designed to protect both societal and environmental reliance on freshwater resources. In the years following the proposal for the planned flooding of the Pongolapoort Dam, the South African Ecological Reserve became a part of the National Water Act of 1998 (Dallas 1997: 82-85; Dube et al. 2015: 271). An Ecological Reserve is also known as environmental flow, or "the quantity and quality of water required to protect aquatic ecosystems to secure ecologically sustainable development and the use of the relevant water resource" (Department of Water Affairs and Forestry, South Africa 2004). South Africa's National Water Act was one of the first in the world to specifically allocate water for use by the environment as part of national legislation



*Sugarcane fields in the Pongola region. Image courtesy of Shira Lanyi.*

## ISSUE ELEVEN : SUMMER 2018

(Department of Water Affairs and Forestry, South Africa 2004). In January of 2006, a Sustainable Usage Plan (SUP) was proposed by the Department of Water Affairs and Forestry to implement a more sustainable pattern of flood releasing that would follow the guidelines of the Ecological Reserve and the National Water Act of 1998. The SUP planned to protect the usage, development, conservation, and management of the water of the Pongolapoort Dam in an appropriate and sustainable manner. The plan

included provisions for the protection of “both the aquatic and associated ecosystems, inclusive of their biodiversity” as well as the development of a “suitable institution that is representative of the host community both in racial and gender terms” (Dube et al. 2015: 270–272). Despite research spanning more than three decades and progressive national water policy laws, the persistent drought and burgeoning populations have given way to more haphazard releases negotiated by the local municipality.



*Hippopotamus spotting in Pongolapoort Nature Reserve. Image courtesy of Shira Lanyi.*

# The River's Stakeholders

One of the river's stakeholders is Dr. Peter Calverly, wildlife ecologist and owner of the Pongola River Camp. Calverly, a thirty-year-old native South African, received his Ph.D. in Biology from VCU's South African "sister school" the University of kwaZulu-Natal. Calverly and his family also own Zingela Safari & Rafting Company, based on a private game reserve along the Tugela River. The Tugela flows from the Drakensburg Mountains to the Indian Ocean further south in kwaZulu-Natal. The Calverly family run a rafting company that normally brings in many enthusiastic kayakers and white-water rafters. Our group spent an entire day paddling down the rocky rapids of the Tugela River with Peter, an avid kayaker and outdoorsman. During our paddle down the Tugela, the rapids were often so low that our inflatable

kayaks, called "cros," barely made it down without a strong push to heave over the muddy rocks. The environmental challenges faced by the river affect not only the water system itself, but also the future of the Calverly family's rafting business. The Calverly family manage their land for wildlife, giraffes, kudu, and other antelope to provide the sustainable control of these populations through the practice of controlled hunting on the Zingela game ranch. Peter's father bought Zingela with the dream of restoring riparian habitats and preserving the natural state of this precious stretch of the Tugela River. Peter now assists in sustaining the family business and often brings his wife, a provincial veterinarian, and his six-week-old baby to relish the beauty of this landscape.



*Lecture from Peter Calverly in the Pongolapoort Nature Reserve.  
Image courtesy of James Vonesh.*

## ISSUE ELEVEN : SUMMER 2018

The Pongola River Camp, another ecotourism business owned and operated by the Calverley family, is also threatened by the multi-year drought and resulting low flows along the Pongola River. Calverley believes that the 2015 construction of the Jozini Mall, the housing operation across the river; severe drought; and the corrupt allocation of municipal resources have led to the current state of the river. Only two years ago, Calverley described this river as “crystal clear.” In previous years, the annual flood releases were timed appropriately to create an environmental flow pattern that allowed the river to return to its natural state. The damage this dam has done to the natural flows of the Pongola River has been a key factor in the decline of many of the local fish species, including the tigerfish,

a source of income for local fishing and gaming businesses, like Pongola River Company. The overgrowth of such alien species as the hydrilla verticillata and the aquatic red-fern, azollaceae, are also the result of the low, nutrient-rich water (Van Vurren 2009). Due to the inability to sell fishing and paddling trips on this river’s murky, overgrown water system, the Pongola River Company is now at risk of closing.

As we paddled down the river, we came upon small groups of people laughing, washing, and bathing in the golden afternoon sun. These are the rural Amathonga people who rely on the river as their major water source. The Pongola River plays a pivotal role in their everyday lives and its decline has a direct impact on their culture and



*The tiger fish is one of Pongola River Company’s main attractions that is gradually becoming less abundant with the increasing drought. Image courtesy of the Pongola River Company.*



*Hydrilla overtaking the production in the Pongola River due to excessive drought and water mismanagement. Image courtesy of Shira Lanyi.*



*The red water fern growing along the Pongola River. Image courtesy of Shira Lanyi.*

society. The Pongola provides the Amathonga people with the water necessary for the survival of their small-scale vegetable gardens and their cattle herds, and it is their primary source for drinking water. Along the river's edges, Peter Calverley and his employees found the carcasses of hundreds of cattle only months ago. Drought coupled with lack of proper water allocation led to their demise. The cook at Peter's camp is the daughter of a local Amathonga farmer and cattle rancher who lost 80 head of cattle this year due to the drought and low water levels that plague the Pongola River and its dependents. Walking along the pan adjacent to the river, our group stumbled upon some of the remains of a doomed Nguni cow.

The people of the town of Jozini represent a third group of stakeholders who live along the Pongola just below the dam. The complexity of their situation is heightened by the growing human waste and pollution, products of the construction of Jozini Mall and low-income housing developments across the river. Our group took a brief stop at Jozini Mall on our way to kayak down the Pongola. The litter surrounding the periphery of the mall, down the dirt roads toward the watershed, and in the neighboring streets was horrifying. As we began our journey downstream, our paddles pushed aside diapers, used toothbrushes, candles, food containers, and other rubbish.

*[See a map of Jozini and Pongola here.](#)*



*An Nguni cow's carcass discovered along the banks of the Pongola River.  
Image courtesy of Shira Lanyi.*



*Abe Nzuzi in Somkhanda Game Reserve South Africa. Image courtesy of Shira Lanyi.*



# Ecological Action on the River

During our journey through South Africa, we were fortunate to have Abe Nzuzo, a native Zulu and expert in the field of South African conservation, as our guide. Abe, who now lives in Jozini with his wife, a local nurse, is a proud local radio talk show host, educator, and wildlife guide. Abe was born in a traditional Zulu village and first met a white person at the age of eleven. His strong ties to the community and his heritage make him an invaluable resource to his community and the preservation of this region.

As a Jozini town local leader, Abe expresses the concerns of his community. Abe confirmed that the recent construction of these two projects on the banks of the Pongola have created a challenging situation that threatens the health and sustainability of the surrounding ecosystem. Abe feels as though education is the next clear step in preventing what is a very rapid decline in the preservation of the natural landscape. “We must target efforts in the schools to improve the situation,” Abe stated in an interview. Few



*Local school children being taught about the ecological issues associated with drought and water mismanagement. Image courtesy of the Pongola River Company.*

## ISSUE ELEVEN : SUMMER 2018

members of the local community play an active role in sustainability in large part because of the lack of education and understanding of the threat pollution has on their home.

The Pongola River Camp, under Peter's directorship, is taking steps to link ecotourism and local education. Menzi, one of the workers at Peter's camp, will begin teaching in local schools this year with a new curriculum focused on the conservation of the region. Pongola River Camp received donations from Kevin Lawrence and Angus Wingfield from Africa Wild Trails, to construct Bush Baby Education Centre, dedicated to the education and exposure of young South Africans to their rich wildlife heritage. Local and

international students are offered the opportunity to have a hands-on lesson in conservation in this unique ecosystem by completing a South African scoring system (SASS) survey of the Pongola River. An SASS survey focuses on the observation of macroinvertebrate species among various ecosystems within a narrow range of the river (Van Ginkel 2011). Macroinvertebrate studies are an important resource in evaluating the quality of the river system in which they thrive (Van Ginkel 2011). Aquatic macroinvertebrates are small invertebrates that spend a portion of their life cycle within the river system. Often these organisms utilize the sediment, leaves, or rocks as shelter or homes during the early phases of their life cycles.



*The nature center at Pongola River Camp Image courtesy of James Vonesh.*

## ISSUE ELEVEN : SUMMER 2018

These small macroinvertebrates rely on certain temperatures, pH, and nutrient levels to survive and are therefore an invaluable resource in determining the health of an aquatic ecosystem (Van Ginkel 2011). Our group participated in a survey along the rocky and sandy shores surrounding the Pongola River Camp. We found shrimp, leeches, snails, dragonfly larvae, mayfly larvae, small fishes, and aquatic worms. Based on the SASS scoring system, our collections suggested that the river is in “poor condition.” This is a fun, interactive way to involve the local community in understanding the importance of conserving this precious resource on which they are unequivocally reliant.

The problems created by the Pongolapoort Dam since its completion in the 1970s cannot be repaired by simply disassembling and removing this vast structure (Dallas 1997: 81). One of the largest sugarcane farmers in the region has purchased access to the reservoir to not only supply his fields, but also to provide the local towns with their water. Much of the area surrounding the reservoir is now a nature reserve and source for ecotourism business (Colvin et al 2016; Dallas 1997: 81–85). These protected areas provide pontoon-boating excursions for groups such as ours. Hippos snorted and laughed their hearty cacophony as we waded past looking out over the backdrop of the Lebombo Mountains. This



*Two local men bathing in the Pongola River. Image courtesy of Shira Lanyi.*

## ISSUE ELEVEN : SUMMER 2018

ecotourism business provides an opportunity for economic gain and a means to utilize the dam to its fullest capacity in its present state.

The intersection of this precious water system, its inhabitants, and the surrounding ecosystem shows how they are currently at odds with one another. The battle over conservation and societal pressures is one that will continue to have an impact on the health and vitality of the Pongola River for future generations. In just the short

amount of time that I visited South Africa, I observed the need for better water distribution and conservation. This is evident from the city of Johannesburg all the way to the small river communities that rely on these systems for survival. While there is no one solution to the severe pressures placed on this river system, small steps can be taken to educate our future generations to value and care for their natural resources and create a world that they wish to call home.



*Children playing along the Pongola River. Image courtesy of Shira Lanyi.*

## References

- Colvin, C., D. Muruven, D. Lindley, H. Gordon, and K. Schachtschneider. 2016. "Water Facts and Futures: Rethinking South Africa's Water Future." *WWF-SA 2016 Water Facts and Futures*. 2–96.
- Dallas, H. F. 1997. "A Preliminary Evaluation of Aspects of SASS (South African Scoring System) for the Rapid Bioassessment of Water Quality in Rivers, with Particular Reference to the Incorporation of SASS in a National Biomonitoring Programme." *South African Journal of Aquatic Sciences* 23: 79–94.
- Department of Water Affairs and Forestry, South Africa. 2004. Sustainable Utilization Plan Pongolapoort Dam. Retrieved from: <https://www.dwa.gov.za/Documents/Other/RMP/Pongolapoort/PongolapoortDamSUPJan06.pdf>.
- Dube, T., V. Wepender, J.H.J. van Vuren, N.J. Smit, and L. Brendonck. 2015. "The Case for Environmental Flow Determination for the Phongola River, South Africa." *African Journal of Aquatic Science*. 40(3): 269–276.
- van Ginkel, C.E. 2011. Eutrophication: present reality and future challenges for South Africa. *Water SA*, 37(5), 693-701. Retrieved February 15, 2017, from [http://www.scielo.org.za/scielo.php?script=sci\\_arttext&pid=S1816-79502011000500010&lng=en&tlng=en](http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S1816-79502011000500010&lng=en&tlng=en).
- Van Vurren, Lani. 2009. Pongolapoort Dam-Development Steeped in Controversy. *The Water Wheel* (May/June 2009). Retrieved from: [http://www.wrc.org.za/Knowledge%20Hub%20Documents/Water%20Wheel/Magazine/WaterWheel\\_2009\\_04\\_WW%20Jul-Aug%2009.pdf](http://www.wrc.org.za/Knowledge%20Hub%20Documents/Water%20Wheel/Magazine/WaterWheel_2009_04_WW%20Jul-Aug%2009.pdf).

## Recommended Citation

Lanyi, Shira. 2018. "Paradise Lost: The Struggle to Preserve the Pongola River and its Inhabitants." *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/paradise-lost/>.

## About the Author

Shira Lanyi, a Richmond native, graduated with a Bachelors in Science in biology with High Honors from Virginia Commonwealth University in May 2018. She will begin her first year of medical school at Virginia Commonwealth University School of Medicine this fall, where she will pursue her second career after a first career as a professional ballerina.

## GEOGRAPHIES

# WATER UNIFIES US ALL

By Kristi Achor Pursell

A dominant narrative in media today tells us that American society is full of juxtaposition and conflict: rural v. urban, rich v. poor, black v. white, conservative v. liberal. We might get the impression that we must stick to our own in-group in order to feel safe and heard. And yet, there is an issue central to life as a Minnesotan regardless of how you identify or with whom you spend your time. That issue—clean water— is a necessity for life and good health. Through my time working for the Cannon River Watershed Partnership (CRWP), I have come to believe, as Maya Angelou wrote in her poem, “Human Family,” that “we are more alike, my friends, than we are unlike” and that, perhaps, water can be the thing that shows us that truth.

CRWP is a small, but mighty nonprofit membership organization with a focus on clean water. Our geographic focus is the land that drains to the Cannon and Straight Rivers, which means the map of our area is unlike that of any you may be used to seeing. We consider six counties that make up the majority of the watershed—Dakota, Goodhue, LeSueur, Rice, Steele, and Waseca—along with their Soil and Water Conservation Districts (SWCDs), to be our primary partners in local government. We regularly work with these entities, as well as with city and township governing bodies, to accomplish work in our area. We also partner with state agencies, such as the Department of Natural Resources (DNR) on Wildlife Management Area projects, the Board



*The Cannon River riverfront in Northfield, Minnesota.  
Photographer Alexius Horatius (CC BY-SA 3.0 US).*



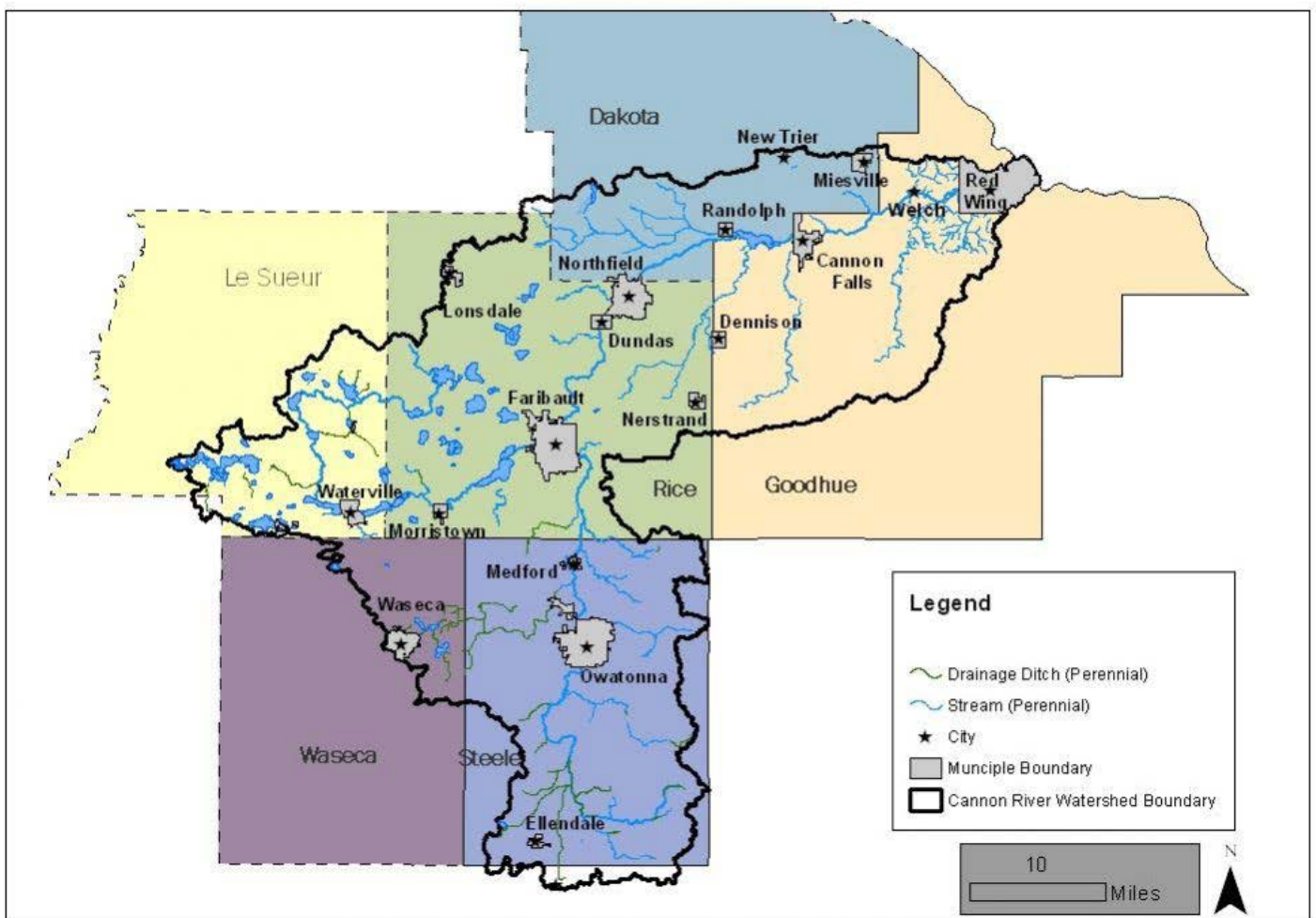
*Northfield youth sweep clear then stencil stormdrains that empty into the Cannon River.  
Image courtesy of CRWP.*

of Water and Soil Resources (BWSR) to convene groups of people whose wastewater treatment processes need an upgrade, and the Minnesota Pollution Control Agency (MPCA) for water monitoring and a qualitative data-gathering project talking to residents in particular sub-watersheds to hear their histories. However, we partner with more groups than just our government entities. CRWP was founded by a group of concerned citizens who wanted an entity to collectively look upstream and down to improve the waters and natural areas that drain into the Cannon, then the Mississippi. As an organization, we feel an obligation on behalf of the citizens in the watershed to partner with interested and affected communities in order to get the results we seek.

Because we work with farmers, youth, town-dwellers, lakeshore property owners, and elected officials, I have come to believe that, although we may have heard there is much to disagree on, water is a place where we can and do collectively come together. We all care deeply about the quality of the water we drink and share with our children and grandchildren. We want to leave our part of the world a little better than when we found it. These are universal truths no matter what your age, walk of life, or profession.

There are many families in our area who have worked the land for generations in order to grow crops and sustain a large sector of the economy in Minnesota. The farmers we work with are willing

### Cannon River Watershed



*The six majority counties that make up the Cannon River Watershed with major municipalities indicated. Image courtesy of CRWP.*





*Volunteers gather at the Cannon River in the Carleton Arboretum, Fall 2017.  
Photographer Heriberto Rosas. Image courtesy of CRWP.*

## ISSUE ELEVEN : SUMMER 2018

to try things their parents or grandparents didn't teach them about, like Kernza, a new perennial grain we are testing with the University of Minnesota both for grazing and grain-harvesting. These are growers and grazers who care deeply about our land and water for the future of farming; you may first meet them over a microbrew before you learn how they make their living.

Similarly, we work with residents in small communities and towns in rural Minnesota. Some of the very best advocates for clean water and some of the best examples of partnering happen in these smaller localities and townships. The decades-old relationships that neighbors or lake association members have with one another have

shown me that, although it can be challenging to get the right people into the room, when trust already exists, there is no limit to what these committed groups of people can accomplish. Together they might raise money to remove invasive species, partner with upstream farmers to improve soil health practices, or create a lake improvement district.

Our rural communities are becoming more and more diverse and, although this can be a point of friction for a community of any size, water by its very nature creates spaces where we can all gather and unite. For example, on one Saturday morning each September, CRWP hosts a Watershed-Wide Clean Up at around a dozen



*Field day on a local farm on Mud Creek, summer 2017. Image courtesy of CRWP.*



*A kid catches a big one at the annual “Take a Kid Fishing Day” near Northfield.  
Image courtesy of CRWP.*

locations simultaneously. This is a time when young and old come out to help pull trash from our rivers, lakes, and streams. The health of water affects us all, and it affects the places we love and where we live. Working together to find solutions that produce clean water benefits every one of us. The Cannon River Watershed Partnership seeks

to bring people together to achieve this lofty goal in our lifetimes.

To learn more about CRWP's work, please visit our website at [crwp.net](http://crwp.net) or contact the author at [kristi@crwp.net](mailto:kristi@crwp.net).

## Recommended Citation

Pursell, Kristi Achor. 2018. "Water Unifies Us All." *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/water-unifies-us-all/>.

## About the Author

Kristi Achor Pursell has a B.A. in English/ Environmental Studies from St. Olaf College and has a background in small-scale farming, environmental education, and leadership. She joined the Cannon River Watershed Partnership (CRWP) in 2015 as the Community Engagement Coordinator. In 2018 she became the Executive Director of CRWP, where she is always searching for ways to make connections for clean water through innovative new and long-term CRWP projects and partnerships.

IN REVIEW

# A TOUR OF THE MISSISSIPPI RIVER VISITOR CENTER

By Joanne Richardson

**T**he Minnesota National River and Recreation Area (MNRRA) is a 72-mile National Park Service unit along the Mississippi River as it flows through the Twin Cities of Minneapolis and

St. Paul. MNRRA is an open secret in the Twin Cities, and it is not widely known as a national park, even by people who live and work within its borders.



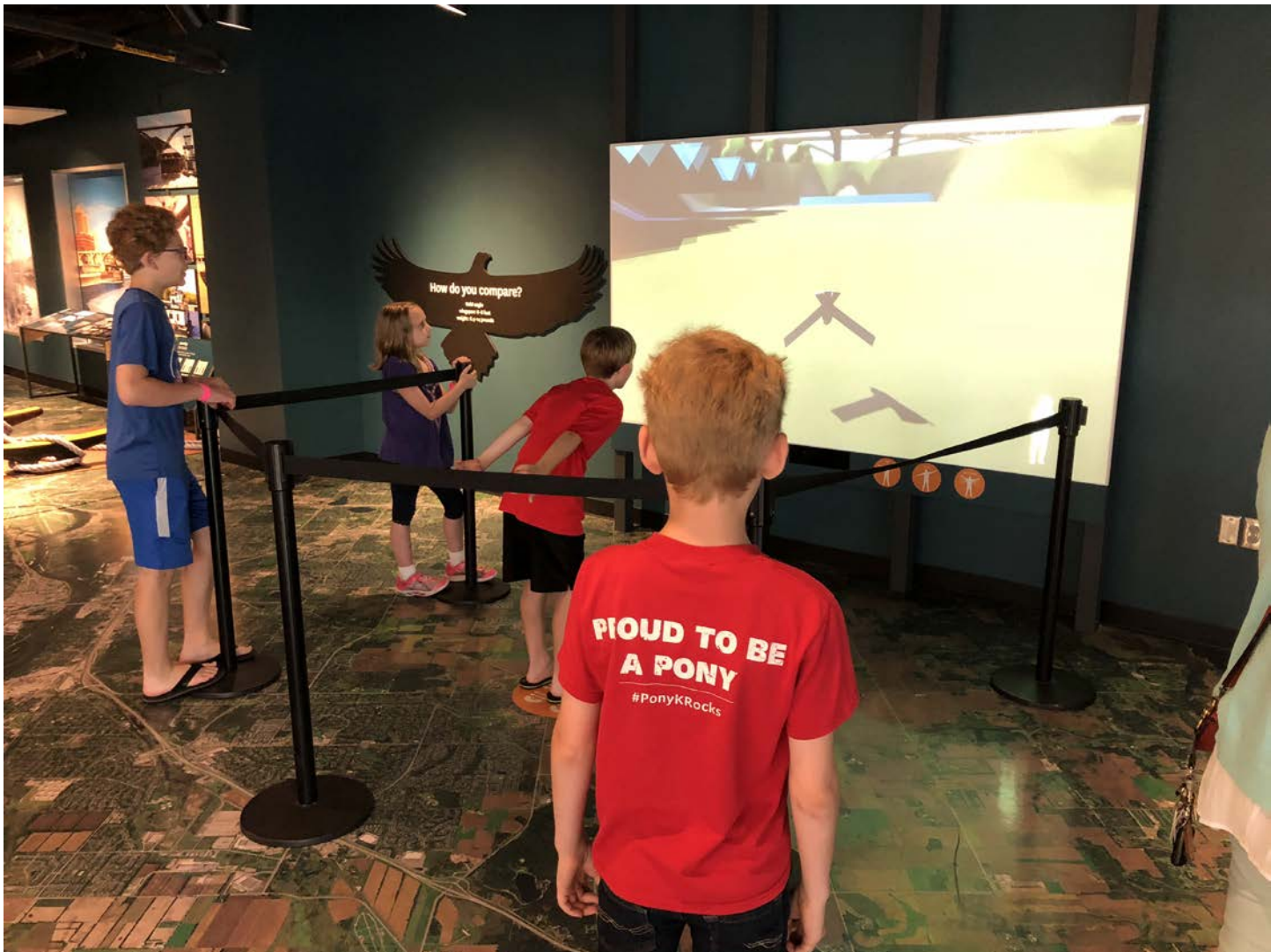
*Approaching the visitor center through the SMM lobby.*

Anchoring the park in downtown St. Paul is an excellent small visitor center located in the lobby of the Science Museum of Minnesota, situated on a high bluff along the river and tucked into the side of downtown. With easy access to transit, city, and river, this is a beautiful, accessible, and advantageous location.

I am of the entirely unscientific opinion that if you really want to know how good something is, ask your kid. Unless the child in question believes that The Correct Answer will win a treat of some kind, I find that you are likely to get startlingly unvarnished truth. Consequently my son John, age eight and one-quarter, and I, made the pilgrimage into the big city to see what we thought

of the visitor center. I'm reasonably sure John agreed to this plan because of the accessibility of treats forbidden at home, and his beloved Science Museum of Minnesota. Consequently, promises made and noted, we set off to Do Important Work.

As we approached the visitor center through the familiar territory of the SMM lobby, John's keen eyes and razor-sharp instincts led him straight to the prominently displayed video game. There was a short line, so he was able to study the technique of others before he had his own try. Standing in front of a video screen that stretches from floor to ceiling, with arms outstretched he flew along the river as an eagle, catching fish and delivering



*The tempting allure of screen time.*

them to a nest. The Very Honest Opinion was noted that the fish resembled cucumbers with fins, but since that was found to be delightful it was not at all a detriment. Tired arms and with motherly prodding to let others take turns, he played several times, diving, doing loop-de-loops, and testing for the game's boundary conditions; How high can I go? Can I go under water? Can I cross the city? Can I fly into a building? Can I fly all the way down the river? How fast can I go?

Stopping just short of physically dragging him, I did induce him to visit the rest of the visitor center. We talked with the park ranger on duty and saw the array of workbooks and activities available. John cast a world-weary eye across

these, having recently worked through many of the activities at Big Bend National Park in Texas. I think he'd be more interested in the activities if we were actually outside in a natural area. I enjoyed the array of pamphlets and maps, but each time I turned to show something to John, well, I think you can guess where he'd disappeared off to.

Child was retrieved and we moved further into the visitor center. I found the signage interesting, and John tried tying maritime knots with the ropes provided. A short clamber over a canoe later, and I eventually gave up, and let him fly like an eagle in the video game while I enjoyed the rest of the exhibit.

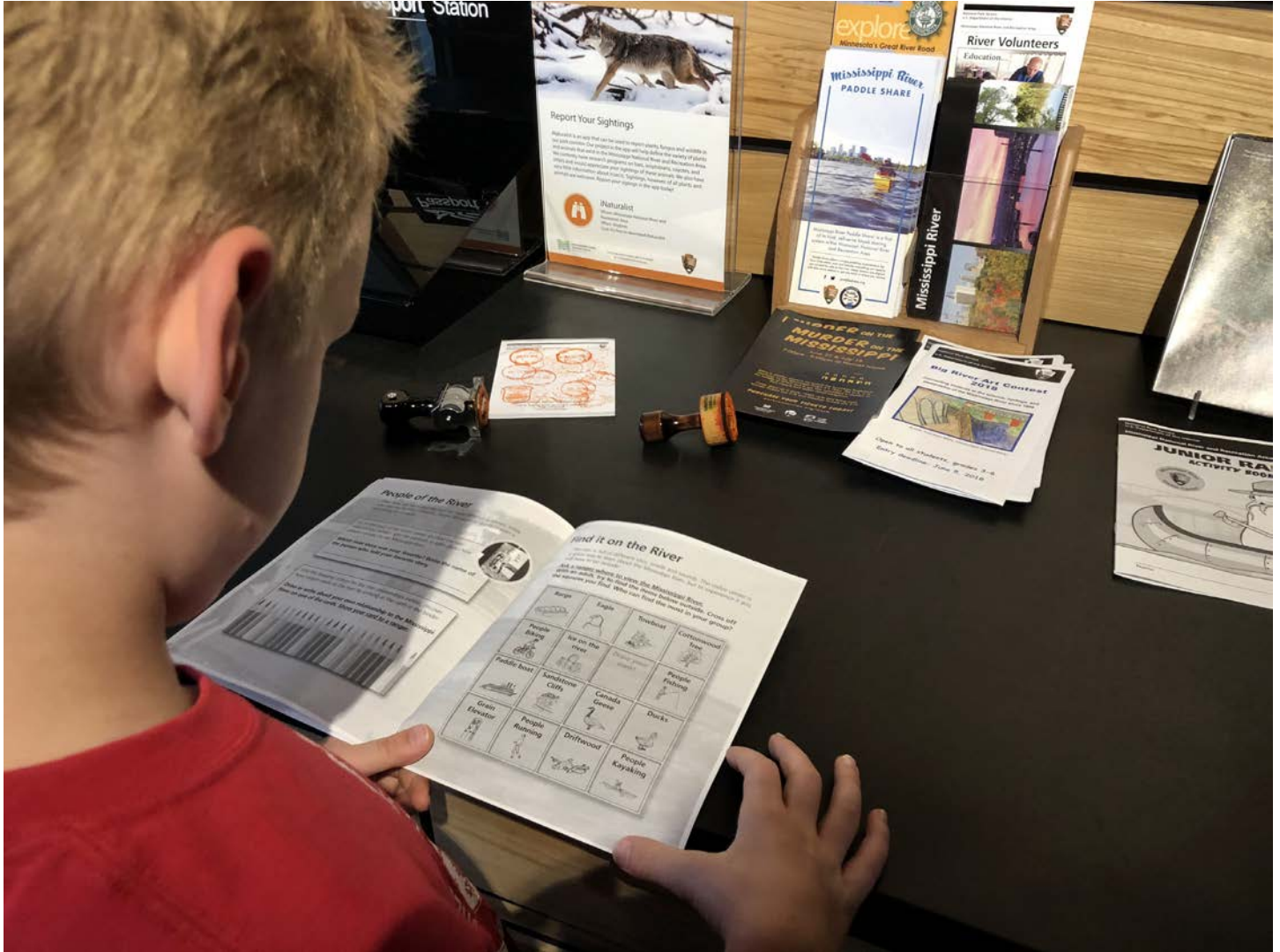


*The prompts to return were a sign of success, he'd flown far enough to reach the edge.*



*One of my favorite signs offers a wonderful summary of the park and why it is significant.*





*He said it looked like fun for later.*



*Tying knots is tricky.*



*Still some growing left to do to catch up to an eagle's wingspan.*



*Shy about sharing the canoe, he enjoyed the presentation.*



*I enjoyed the array of interpretive materials that included compelling stories about people and the river.*

# Explore the park's history



*The digital kiosk was excellent, nice detail but not overwhelming.*

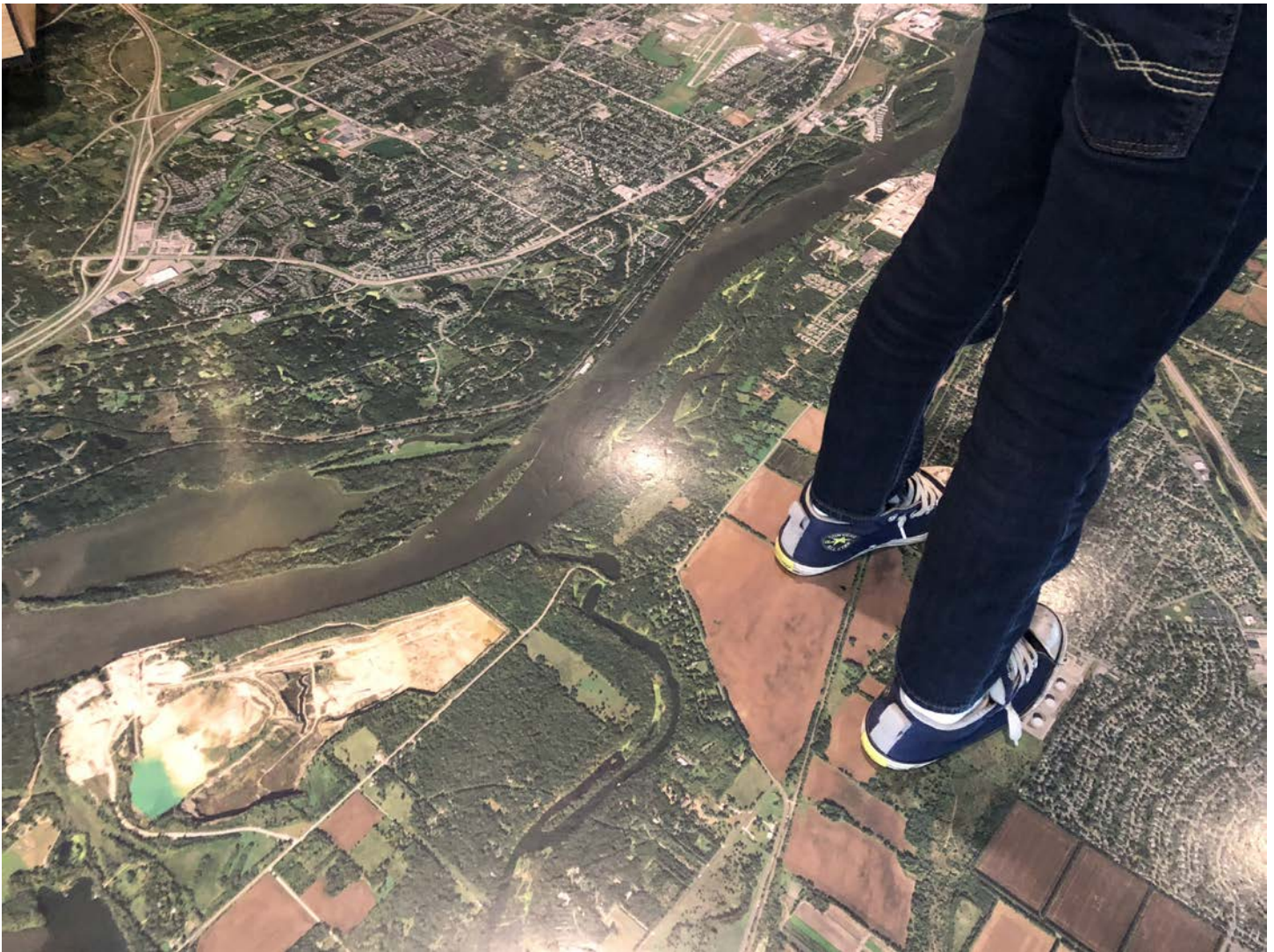
## ISSUE ELEVEN : SUMMER 2018

Some time later, when our paths crossed again, I admonished him for standing in the river and risking wet shoes; he finally noticed the floor graphic which clearly indicated he was standing in the middle of the river. The withering look I received indicated that the joke had fallen flat, but he did indulge me for a few moments as I tried to Explain Important Things and point out some favorite places. Well, I had fun at least.

Ultimately, we both loved the visitor center for vastly different reasons. The eagle's flight video game had enduring appeal that enabled me to truly enjoy the rest of the exhibit while John remained happily occupied. He's excited at the prospect of going back, fishing for cucumbers,

and remembers the connection between eagles, fish, and trees. I think other lessons escaped him, but I know he'll have more opportunities to learn them. I went in with a good basis of knowledge myself, but I like to think that people who haven't made the river their profession will be able to take the knowledge of city and river as national park will enjoy the opportunity to learn a bit more about our beautiful city and river.

As I write this three weeks later, the eight year-old honest witness does not remember that the river is part of a park, or that this is unusual and special. He remembers the "best video game I ever played."



*Impressive details, if you look down.*

*All images courtesy of the author.*

## Recommended Citation

Richardson, Joanne. 2018. "A Tour of the Mississippi River Visitor Center." *Open Rivers: Rethinking Water, Place & Community*, no. 11. <http://editions.lib.umn.edu/openrivers/article/a-tour-of-the-mississippi-river-visitor-center/>.

## About the Author

Joanne Richardson is the digital information strategist for River Life at the University of Minnesota and production manager for *Open Rivers*. She has a background in landscape architecture, geology, and computer science.